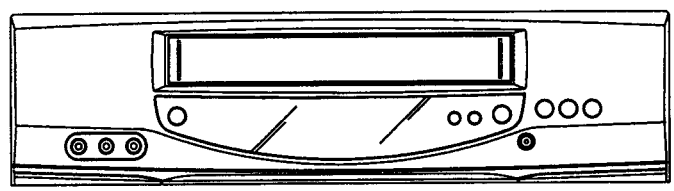
SERVICE MANUAL

ORION

VH-2907 HiFi

VIDEO CASSETTE RECORDER



VHS PAL

ORIGIN AL
CHASSIS CODE A

Best. Nr. SM2907

Design and specifications are subject to change without notice.

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

3. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

4. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the CHASSIS CODE.)
1. MODEL NUMBER and CHASSIS CODE
   You can find it in the back of your unit.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

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VH-2907 HIFI SI

SERVICE MANUAL

VIDEO CASSETTE RECORDER

REVISION 1
CHASSIS CODE B

VHS PAL

CHASSIS CODE	IC1001
A	OEC7070A
B	OEC7070B

Please file this revision with the original version.

NOTE FOR THE REPLACEMENT PARTS LIST

ADDRESS	CHASSIS CODE A DATA	CHASSIS CODE B DATA
D8	71	7D
FC	99	00

Change of IC

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	CHASSIS CODE A		CHASSIS CODE B	
	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
IC1001	I56F57070A	IC OEC7070A	I56F57070B	IC OEC7070B
PCB010	A4F509B010K	SYSCON PCB ASS'Y (VERSION A) VMA234A	A4F509B010K	SYSCON PCB ASS'Y (VERSION B) VMA234A

SYSCON PCB's are interchangeable.

SPEC.NO.	M4F5-09B
O/R NO.	U244519

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GENERAL SPECIFICATIONS

G-1	VCR System	System			VHS Player / Recorder
		Video System			PAL
		Hi-Fi STEREO			Yes
		NTSC PB(PAL60Hz)			Yes
		Deck		DECK	OVD-7
				Loading System	Front
				Motor	3
		Heads	Video Head		4Head
			FM Audio Head		2Head
			Audio /Control		Mono / Yes
			Erase(Full Track Erase)		Yes
		Tape Speed	Rec	PAL	SP/LP
				NTSC	-
			Play	PAL	SP/LP
				NTSC	SP
		Fast Forward / Rewind Time (Approx.)			FF:1'12"/REW:1'12"
				with Cassette	E-180
		Forward/Reverse Picture Search		NTSC or PAL-M	SP=3x, 5x
				PAL or SECAM	SP/LP=5x ,7x/7x, 13x
		Frame Advance			1/10
		Slow Speed			1/5~1/30
G-2	Tuning System	Broadcasting System			CCIR System BG
		Tuner and Receive CH		System	1Tuner
				Destination	Oscar(W/ HYPER)
				Tuning System	F-Synth
				Input Impedance	VHF/UHF 75 OHM
				CH Coverage	E2~E4, X~Z+2, S1~S10, E5~E12,S11~S41,E21~E69
		Intermediate Frequency		Picture(FP)	38.9 MHz
				Sound(FS)	33.4 MHz
				FP-FS	5.5 MHz
		Preset CH			80CH
		RF Converter Output			Yes
			Channel		36 ch 23 ~ 69ch
			Level/Impedance		73 dBu / 75 Ohm
			Sound Selector		No
		Stereo/Dual TV Sound			G-ST
		Tuner Sound Muting			Yes
G-3	Power	Power Source		AC	230V 50Hz
				DC	-
		Power Consumption		(at AC)	11W at 230 V 50 Hz
				Stand by (at AC)	3W at 230 V 50 Hz
				Per Year	-
		Protector		Power Fuse	Yes
				Dew Sensor	No
G-4	Regulation			Safety	CE
				Radiation	CE
G-5	Temperature			Operation	+5°C ~ +40°C
				Storage	-20°C ~ +60°C
G-6	Operating Humidity				Less then 80% RH
G-7	Signal	Video Signal		Input Level	1 V p-p/75 ohm
				Output Level	1 V p-p/75 ohm
				S/N Ratio (Weighted)	53dB
				Horizontal Resolution at SP Mode	240Lines
		Audio Signal (0dB=0.775Vrms)		Input Level	-3.8dB/50Kohm
				Output Level	-3.8dB/1Kohm
				S/N Ratio at SP (Weighted)	42 dB
				Harmonic Distortion (1KHz)	1.5 %
				Frequency Response at SP	100Hz - 10kHz
				at LP	100Hz - 5kHz
				at SLP	-
		Hi-Fi Audio Signal		Dynamic Range : More than	75 dB
				Frequency Response	20Hz ~20kHz
				Wow And Flutter : Less than	0.01 %Wrms
				Channel Separation : More than	60 dB
				Harmonic Distortion : Less than	1.0 %
G-8	On Screen Display	Menu			Yes
			Menu	Type	Character
			ATS		Yes
			Timer Rec Set		Yes
			VCR Extension		Yes
				Auto Repeat On/Off	Yes
				Scene Repeat	Yes
				Audio Dubbing	Yes
			VCR Set-Up		Yes
				NICAM Auto/Off	No

GENERAL SPECIFICATIONS

			Audio Mix On/Off	Yes	
			Color System		No
			Sharpness	Yes	
			BBE On/Off	Yes	
		CH Set-Up		Yes	
			CH Tuning	Yes	
			Auto Tuning		No
			CH Mapping	Yes	
			Guide CH Set		No
		Pin Code Registration			No
		System Set-Up		Yes	
			Clock Set	Yes(Calendar 24H)	
			Language	Yes	
			AV2 DEC/AV	Yes	
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry		Yes	
		NICAM 1/2,NICAM Off,Audio Output			No
		Stereo,Audio Output,Bilingual		Yes	
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)		Yes	
		Others	CH/AV	Yes	
			Clock/Date	Yes	
			Repeat		No
			Pin Code		No
			Tape Counter	Yes	
			Index	Yes	
			Hotel Lock		No
			Tape Speed	Yes	
			Manual Tracking (Bar Setting)	Yes	
			Hi-Fi	Yes	
			S-Repeat/SR-R/SR-Play	Yes	
			VPS	Yes	
			PDC		No
			TEST Signal	Yes	
G-9	OSD Language	OSD Language Setting		Eng Ger Fre Spa Ita Germany	
G-10	Clock,Timer and Timer Back-up	Calendar		1990/1/1 ~ 2081/12/31	
		Timer Events		8 Program/ 1 Month	
		One Touch Recording Max Time		SP:5Hours LP:10 Hours	
		OTPB Valid Time			No
		Timer Back-up (at Power Off Mode)		30	Min
G-11	Display	Indicator		Yes	
		Indicator Type		LED Module	
			Clock/Counter,CH,Timer Rec,OTR, Play Rec,FF(Cue),Rew(Rev),Stop,ATR,Eject	Yes	
			Pause	Yes	
			Still	Yes	
			Slow	Yes	
			WKL,Y.M.D,Start,End		No
			AFT		No
			Repeat		No
			A-DUB	Yes	
			VCR	Yes	
			Memory		No
			Index		No
			VPS	Yes	
			PDC		No
			SP		No
			LP		No
			SLP		No
			AM		No
			PM		No
			F1,F2		No
			RF Output CH	Yes	
			Tape In	Yes	
G-12	Remote Control	Unit		RC-ED	
		Glow in Dark Remocon			No
		Power Source	Voltage(D.C)	3V	
			UM size x pcs	UM-4 x 2 pcs	
		Total Keys		33 Keys	
		Keys	Power	Yes	
			1	Yes	
			2	Yes	
			3	Yes	
			4	Yes	
			5	Yes	
			6	Yes	
			7	Yes	
			8	Yes	

GENERAL SPECIFICATIONS

			9	Yes	
			0 / AV	Yes	
			CH / Tracking Up	Yes	
			CH / Tracking Down	Yes	
			Input Select		No
			Play		No
			Play / Up		No
			Play / Up / Slow	Yes	
			F.Fwd / Right	Yes	
			Rew / Left	Yes	
			Pause		No
			Pause/Still	Yes	
			Stop/Down	Yes	
			Rec/OTR	Yes	
			Eject	Yes	
			Counter Reset	Yes	
			Speed	Yes	
			Timer Rec	Yes	
			Index	Yes	
			TV / VCR	Yes	
			Program		No
			Program / Video Plus+	Yes	
			Auto Tracking		No
			Set/Tracking+		No
			Set/ Tracking -		No
			Menu	Yes	
			Enter	Yes	
			Cancel/Ch Skip	Yes	
			Call	Yes	
			Zero Return	Yes	
			Clock/Counter	Yes	
			CM Skip		No
			Audio Select	Yes	
G-13	Features	Auto Head Cleaning		Yes	
		Auto Tracking		Yes	
		Index Search		Yes	
		HQ (VHS Standard High Quality)		Yes	
		Auto Power On, Auto Play, Auto Rewind, Auto Eject		Yes	
		Auto Repeat		Yes	
		Auto Power Off		Yes	
		VIDEO PLUS+(SHOWVIEW,G-CODE)		Yes	
		ATS		Yes	
		PDC			No
		VPS		Yes	
		Reverse Slow		Yes	
		One Touch Playback			No
		Picture Control(Sharpness)		Yes	
		Channel Lock			No
		Hotel Lock			No
		Anti Theft			No
		Audio Dubbing		Yes	
		Remote Control Code 1/2			No
		BBE Audio		Yes	
		Rec END Search			No
		SQPB			No
		CATV		Yes	
		CM Skip(30sec x 6 Times)			No
G-14	Accessories	Owner's Manual		Yes	
			Language	German	
			w/Guarantee Card	Yes	
		Remote Control Unit		Yes	
		Dew Cation Sheet			No
		Battery		Yes	
			UM size x pcs	UM-4 x 2 pcs	
		Tape Rewinder			No
		Safety Tip			No
		Toll Free Insert Sheet			No
		Quick Set-Up Sheet		Yes	
		Information Sheet (Buyer Supply)		Yes	
		75 Ohm Coaxial Cable		Yes	
			type	Double shield	
		U/V Mixer			No
		DC Car Cord (Center+)			No
		Guarantee Card			No
		Warning Sheet			No
		Circuit Diagram			No
		Antenna Change Plug			No

GENERAL SPECIFICATIONS

		Service Facility List				No
		Important Safeguard				No
		Dew/AHC Caution Sheet				No
		AC Plug Adapter				No
		AC Cord				No
		AV Cord (2Pin-1Pin)				No
		Registration Card				No
		21pin Cable				No
		300 ohm to 75 ohm Antenna Adapter				No
G-15	Interface	Switch		Power	Yes	
				Play	Yes	
				Pause/Still		No
				System Select		No
				One Touch Playback		No
				Channel Up	Yes	
				Channel Down	Yes	
				F.FWD/Cue	Yes	
				Rew/Rev	Yes	
				Eject/Stop	Yes	
				Rec/OTR	Yes	
				Main Power SW		No
		Indicator		Power		No
				Stand by		No
				Rec/OTR		No
				Repeat		No
				Tape In		No
				Kurupika Guide		No
				One Touch Playback		No
		Terminals	Front	Video Input	RCA x1	
				Audio Input	RCA x 2(Stereo)	
				Other Terminal		No
			Rear	Video Input		No
				Audio Input		No
				Video Output		No
				Audio Output	RCA x 2(Stereo)	
				Euro Scart	2SCART	
				Ext Speaker		No
				DC Jack 12V(Center +)		No
				VHF/UHF Antenna Input/Output	DIN Type	
				AC Inlet		No
G-16	Set Size			Approx. W x D x H (mm)	360 x 226 x 95	
G-17	Weight			Net (Approx.)	3.2 kg(- lbs)	
				Gross (Approx.)	3.8 kg(- lbs)	
G-18	Carton		Master Carton			No
				Content	-	
				Material	-	
				Dimensions W x D x H(mm)	-	
				Description of Origin	-	
			Gift Box		Yes	
				Material	Single/White	
				Dimensions W x D x H(mm)	429 x 292 x 168	
				Pulp Package	Yes	
				Design	As Per BUYER 's	
				Description of Origin		No
			Drop Test	Natural Dropping	1 Corner / 3 Edges / 6 Surfaces	
				Height (cm)	80cm	
			Container Stuffing(40' container)		2992	Sets
G-19	Cabinet Material			Cabinet Front	PS - 94HB	

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: TOP CABINET AND FRONT CABINET (Refer to Fig. 1-1)

1. Remove the 4 screws ①.
2. Remove the Top Cabinet in the direction of arrow (A).
3. Unlock the 7 supports ②.
4. Remove the Front Cabinet in the direction of arrow (B).

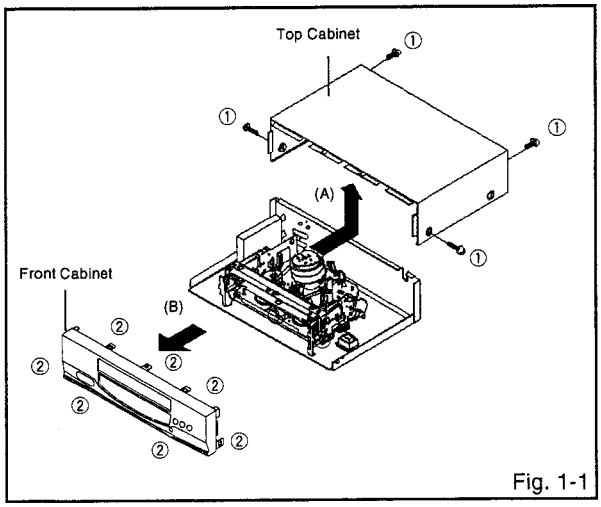


Fig. 1-1

1-2: FLAP (Refer to Fig. 1-2)

1. Open Flap to 90° and flex in direction of arrow (A), at the same time slide in direction of arrow (B).
2. Then lift in direction of arrow (C).

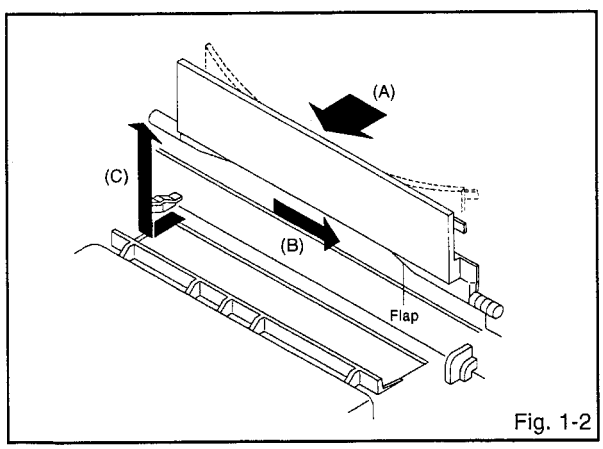


Fig. 1-2

1-3: DECK CHASSIS (Refer to Fig. 1-3)

1. Remove the 3 screws ①.
2. Disconnect the following connectors: (CP1001, CP4001, CP4002 and CP4003).
3. Remove the Deck Chassis in the direction of arrow.

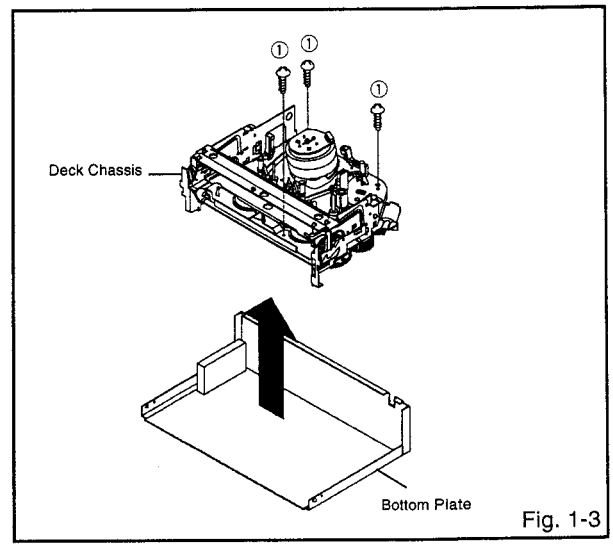


Fig. 1-3

1-4: SYSCON PCB AND AUDIO PCB (Refer to Fig. 1-4)

1. Remove the 2 screws ①.
2. Remove the screw ②.
3. Remove the Syscon PCB in the direction of arrow (A).
4. Remove the Audio PCB in the direction of arrow (B).

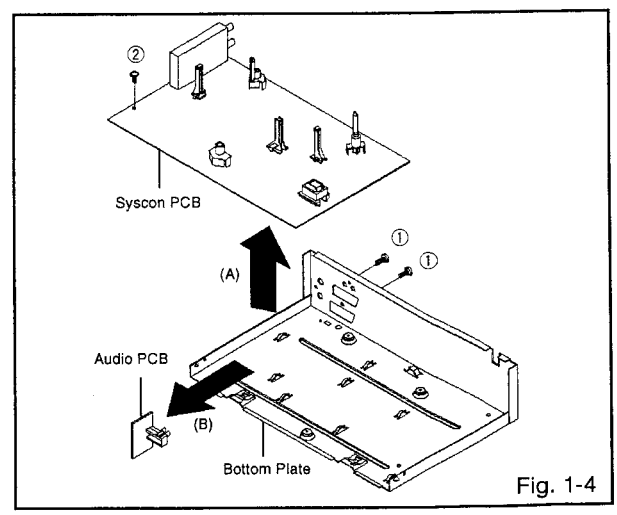


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports ①.
2. Slide the 2 supports ② and remove the Top Bracket.

NOTE

1. After the installation of the Top Bracket, bend the support ① so that the Top Bracket is fixed.

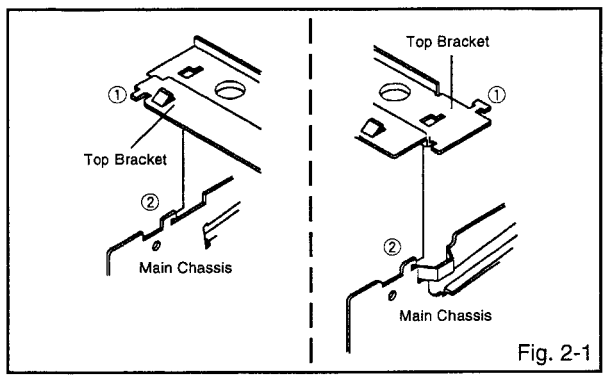


Fig. 2-1

2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

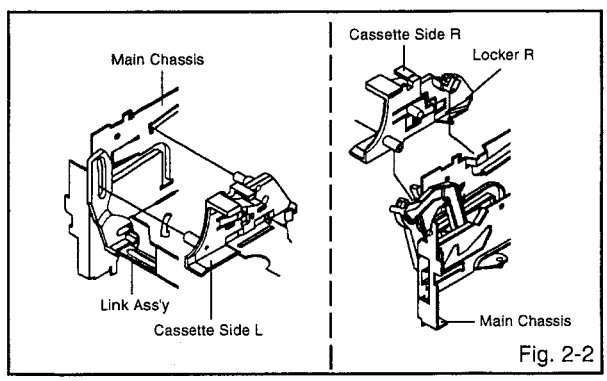


Fig. 2-2

2-3: CASSETTE SIDE L/R (Refer to Fig. 2-3-A)

1. Remove the Locker Spring.
2. Unlock the 4 supports ① and then remove the Cassette Side L/R.
3. Unlock the support ② and then remove the Locker R.

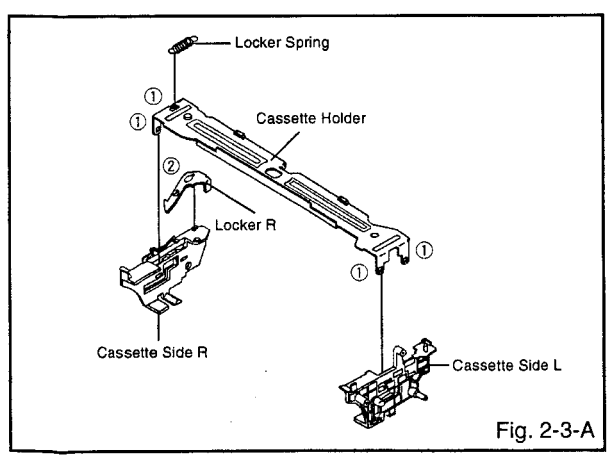


Fig. 2-3-A

NOTE

1. In case of the Locker R installation, check if the two positions of Fig.2-3-B are correctly locked.
2. When you install the Cassette Side R, be sure to move the Locker R after installing.

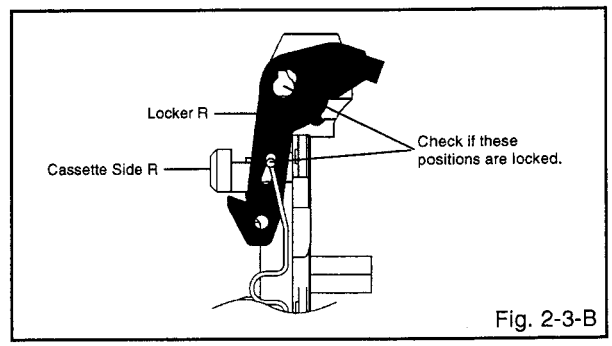


Fig. 2-3-B

2-4: LINK UNIT (Refer to Fig. 2-4)

1. Set the Link Unit to the Eject position.
2. Unlock the support ①.
3. Remove the (A) side of the Link Unit first, then remove the (B) side.

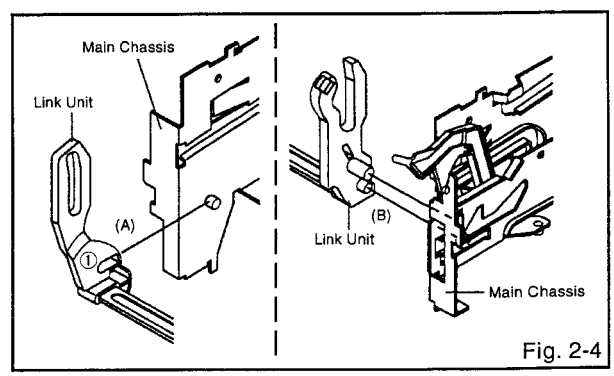


Fig. 2-4

2-5: LINK LEVER/FLAP LEVER (Refer to Fig. 2-5)

1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.

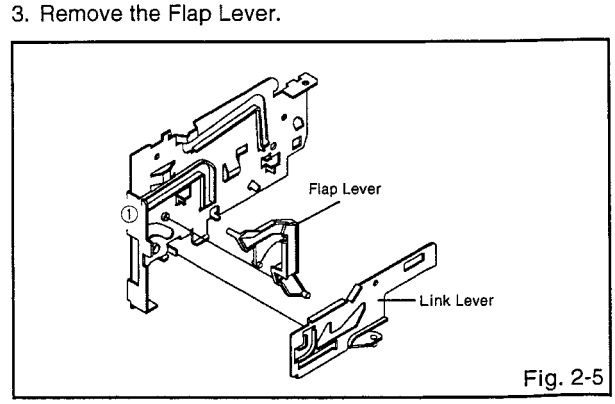


Fig. 2-5

DISASSEMBLY INSTRUCTIONS

2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

1. Remove the screw ①.
2. Remove the Loading Motor.
3. Remove the Worm.

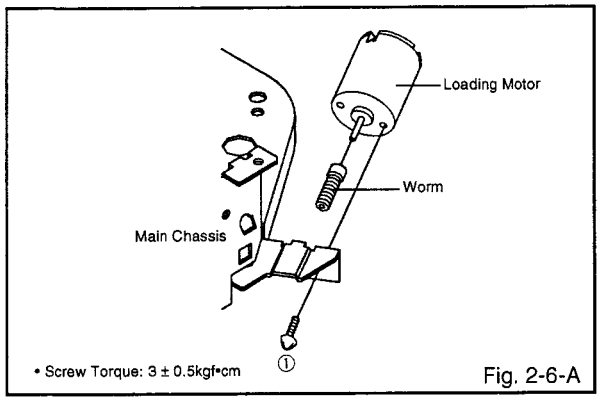


Fig. 2-6-A

NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-6-C.

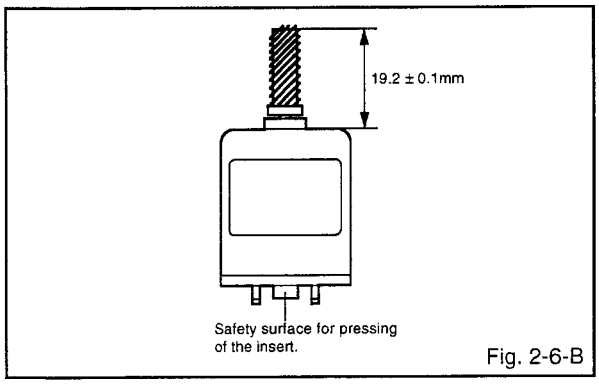


Fig. 2-6-B

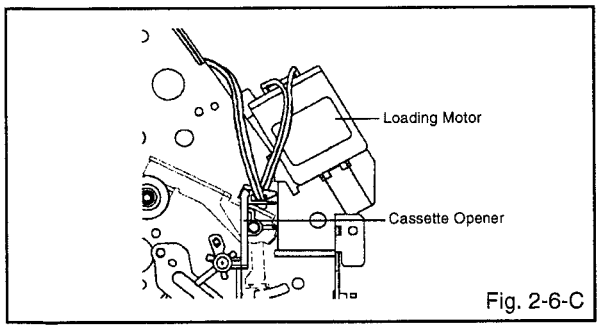


Fig. 2-6-C

2-7: TENSION ASS'Y (Refer to Fig. 2-7-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-7-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.

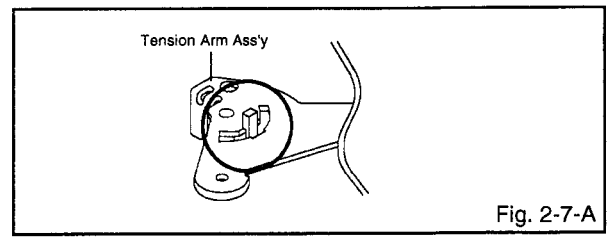


Fig. 2-7-A

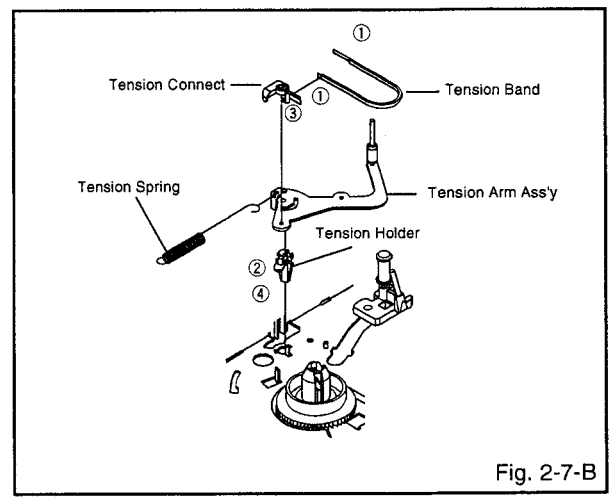


Fig. 2-7-B

NOTE

1. In case of the Tension Band installation, note the direction of the installation. **(Refer to Fig. 2-7-C)**
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.

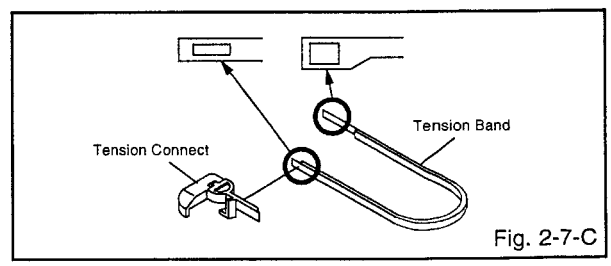


Fig. 2-7-C

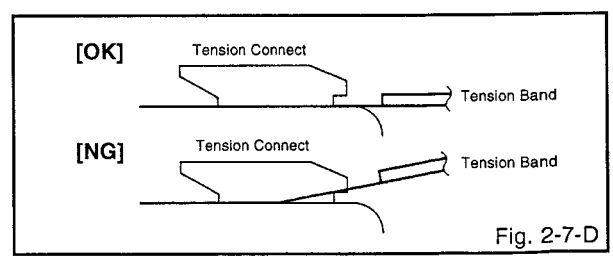


Fig. 2-7-D

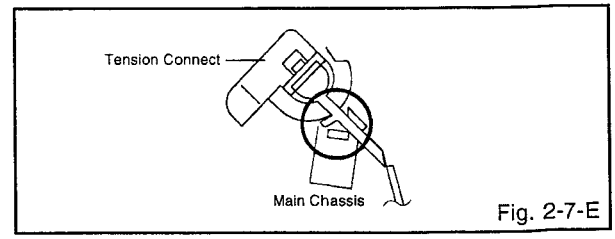


Fig. 2-7-E

DISASSEMBLY INSTRUCTIONS

2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports ① and remove the T Brake Band.

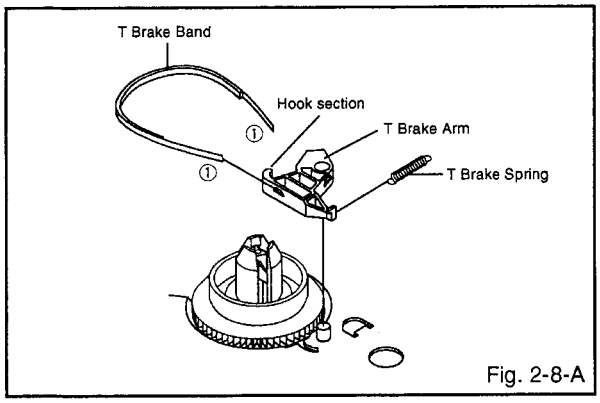


Fig. 2-8-A

NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-8-B.

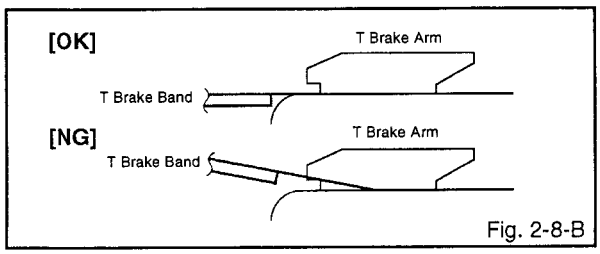


Fig. 2-8-B

2-9: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-9-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.
3. Remove the Idler Arm Ass'y and Idler Gear.

NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) **(Refer to Fig. 2-9-A)** Do not adhere the stains on it.
5. When you install the reel, clean the shaft and grease it (FG-84M). (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

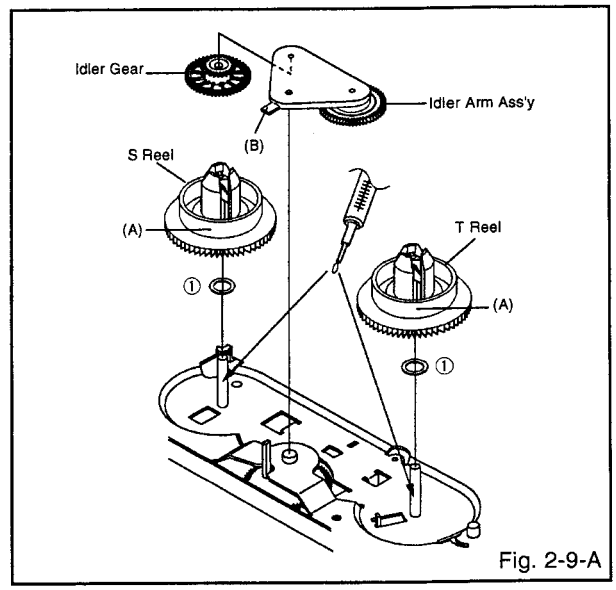


Fig. 2-9-A

NOTE

1. In case of the S Reel and T Reel installation, check if the correct parts are installed. **(Refer to Fig. 2-9-B)**
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C. And also set it so that the section "B" of Fig. 2-9-A is placed under the Main Chassis tab.

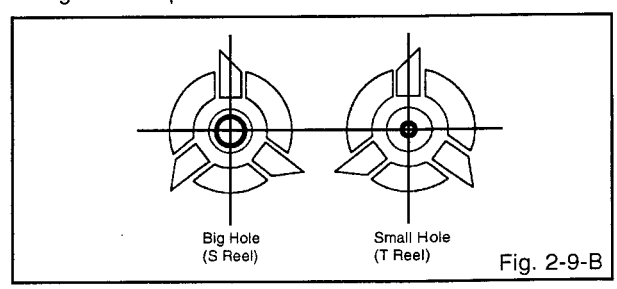


Fig. 2-9-B

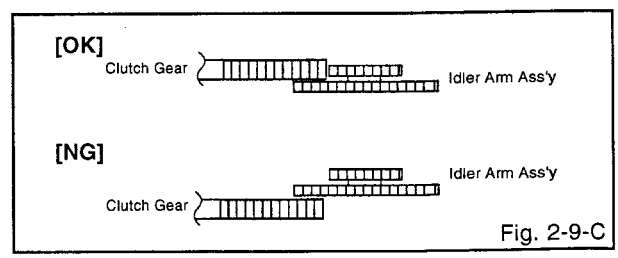


Fig. 2-9-C

DISASSEMBLY INSTRUCTIONS

2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/ P5 ARM ASS'Y (Refer to Fig. 2-10-A)

1. Unlock the support ① and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.

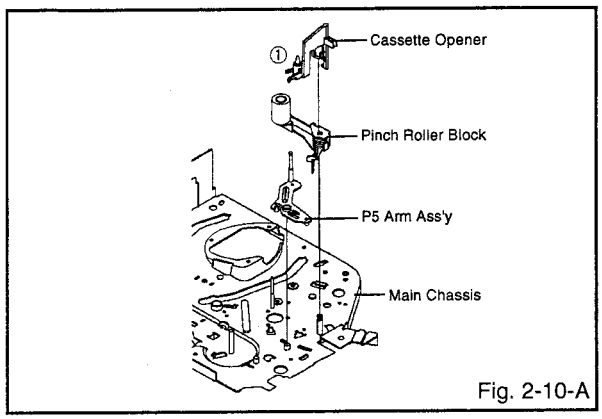


Fig. 2-10-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-10-B.

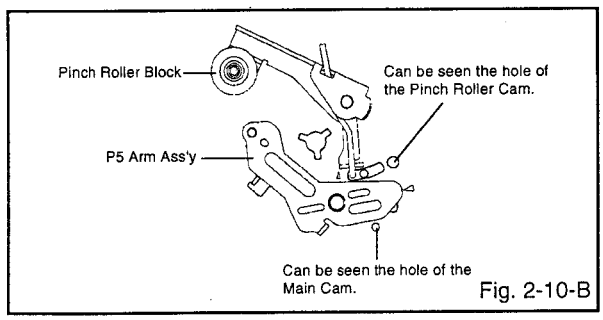


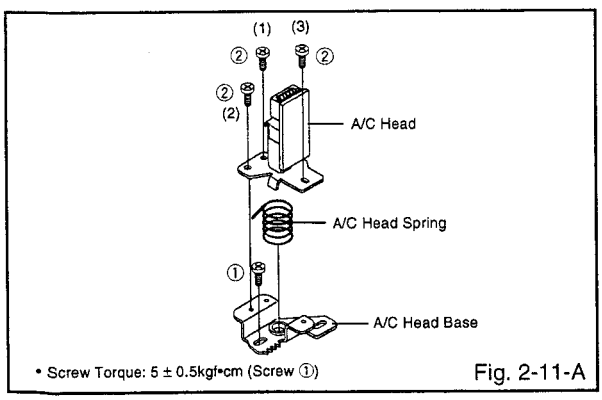
Fig. 2-10-B

2-11: A/C HEAD (Refer to Fig. 2-11-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-11-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



• Screw Torque: 5 ± 0.5kgf•cm (Screw ①)
Fig. 2-11-A

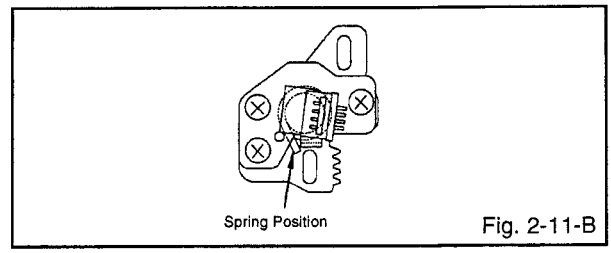
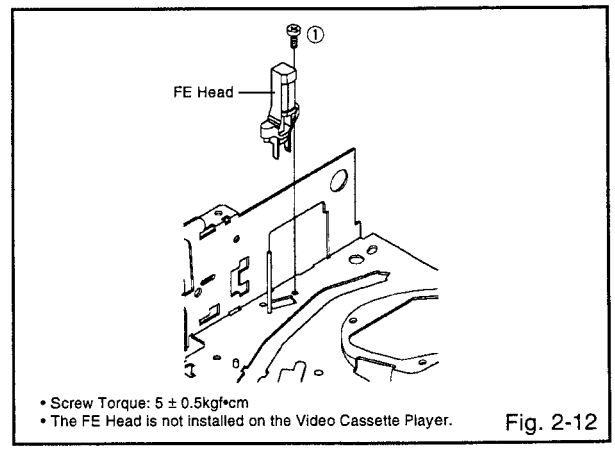


Fig. 2-11-B

2-12: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-12)

1. Remove the screw ①.
2. Remove the FE Head.



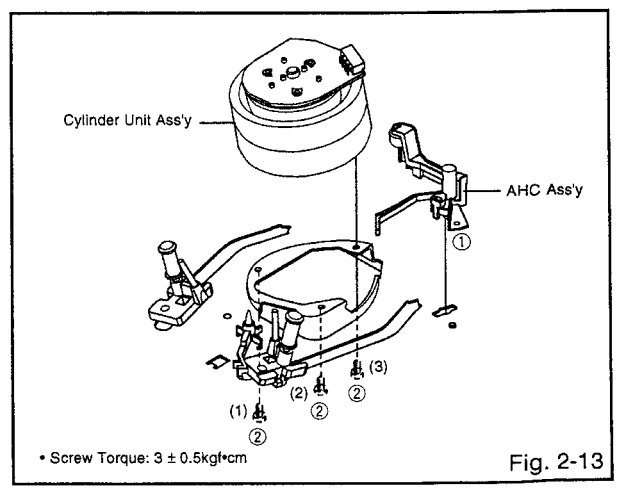
• Screw Torque: 5 ± 0.5kgf•cm
• The FE Head is not installed on the Video Cassette Player.
Fig. 2-12

2-13: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-13)

1. Unlock the support ① and remove the AHC Ass'y.
2. Disconnect the following connector: (CD2001)
3. Remove the 3 screws ②.
4. Remove the Cylinder Unit Ass'y.

NOTE

1. When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.



• Screw Torque: 3 ± 0.5kgf•cm
Fig. 2-13

DISASSEMBLY INSTRUCTIONS

2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14-A)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.

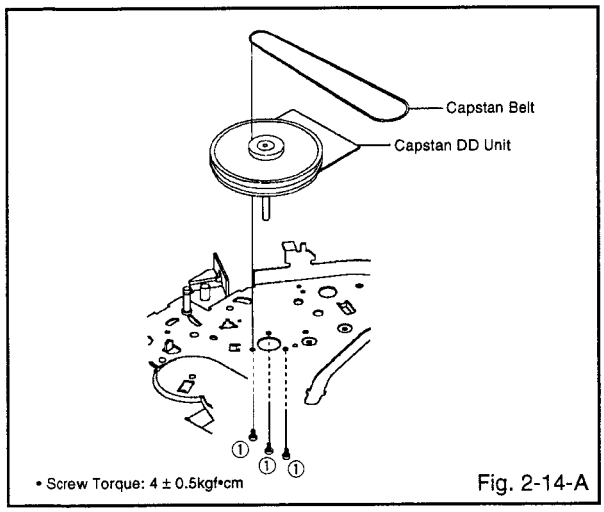


Fig. 2-14-A

NOTE

1. In case of the Capstan DD Unit installation, apply the silicon bond (TSE3843-W) on the position Fig. 2-14-B correctly. (If no silicon bond applied, abnormal noise will be heard on the deck operation.) **(Refer to Fig. 2-14-B, C)**

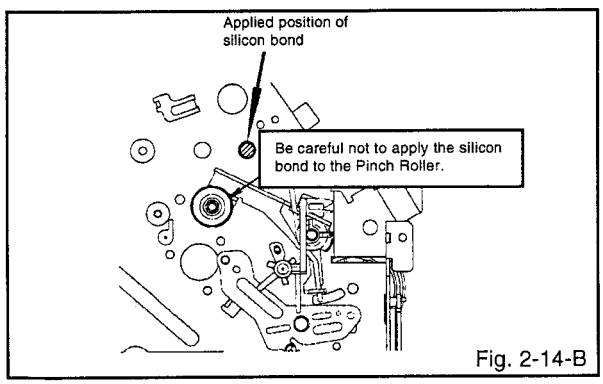


Fig. 2-14-B

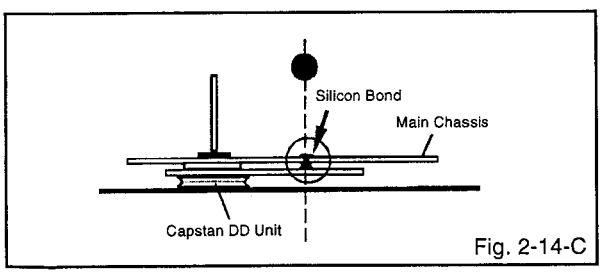


Fig. 2-14-C

2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

1. Remove the E-Ring ①, then remove the Main Cam.
2. Remove the E-Ring ②, then remove the Pinch Roller Cam and Joint Gear.

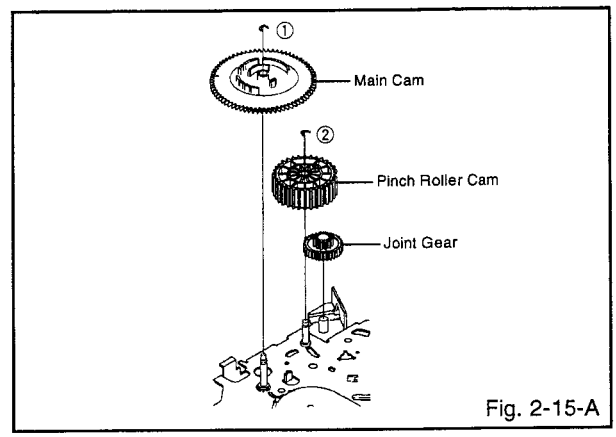


Fig. 2-15-A

NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as the circled section of Fig. 2-15-B so that the each markers are met. **(Refer to Fig. 2-15-B)**

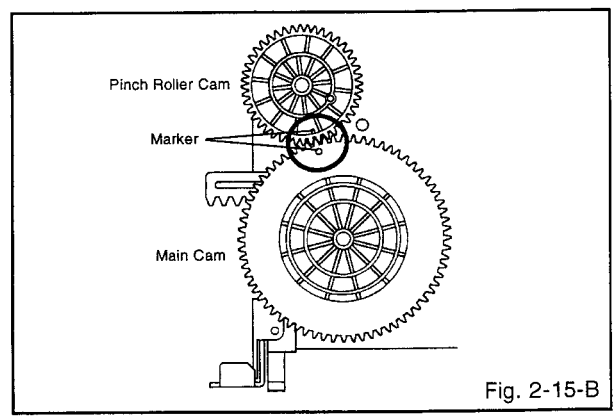


Fig. 2-15-B

2-16: LOADING GEAR S/T UNIT (Refer to Fig. 2-16-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.

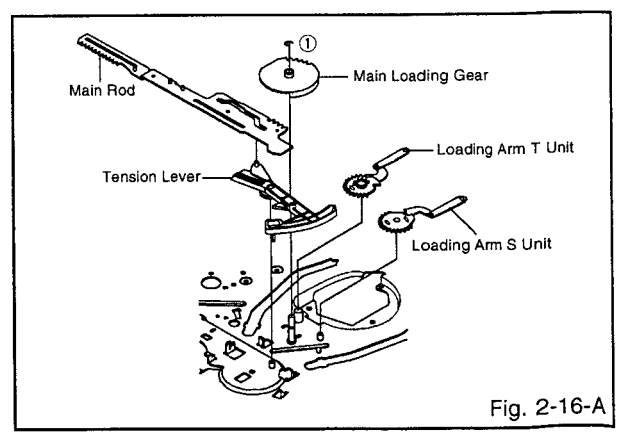


Fig. 2-16-A

DISASSEMBLY INSTRUCTIONS

NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. **(Refer to Fig. 2-16-B)**

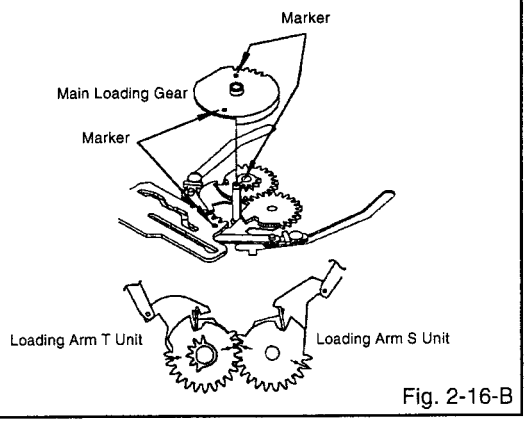


Fig. 2-16-B

2-17: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/ CLUTCH GEAR (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.

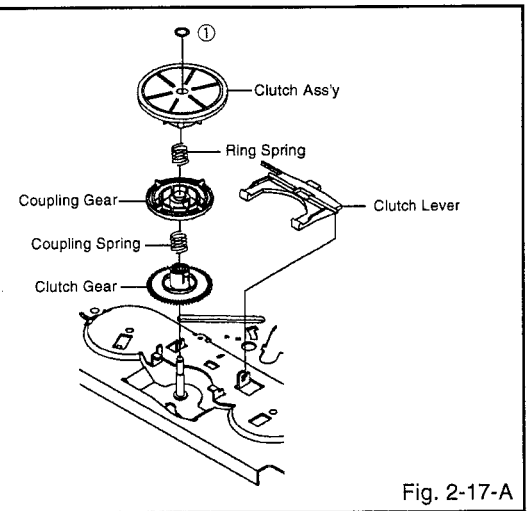


Fig. 2-17-A

NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. **(Refer to Fig. 2-17-B)**

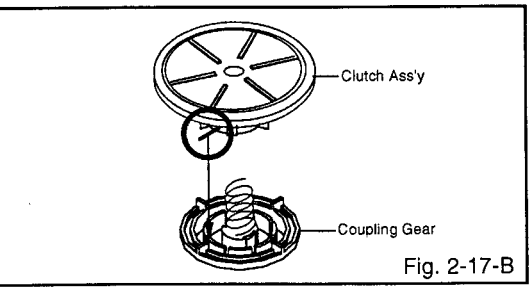


Fig. 2-17-B

2-18: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP (Refer to Fig. 2-18-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S Unit and Inclined Base T Unit.

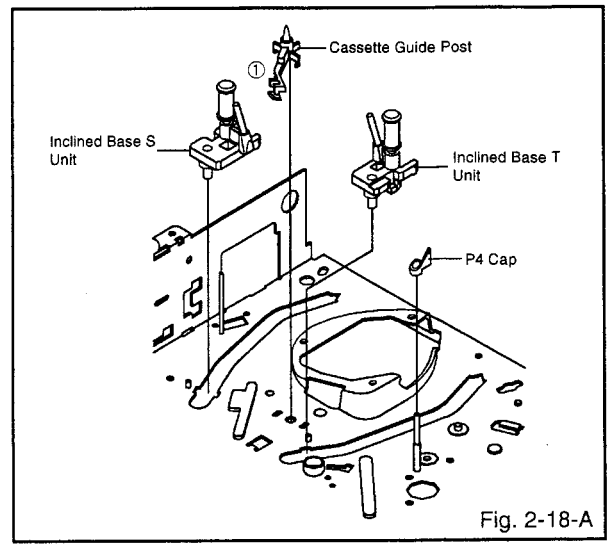


Fig. 2-18-A

NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-18-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-18-C.

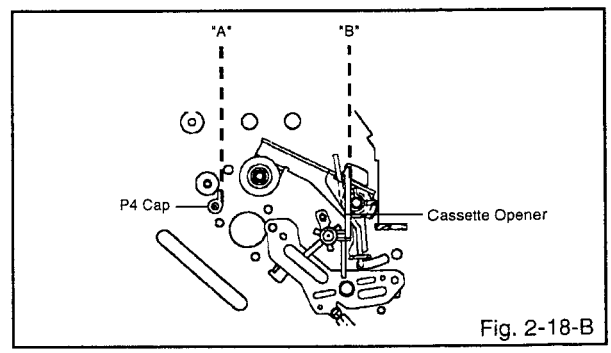


Fig. 2-18-B

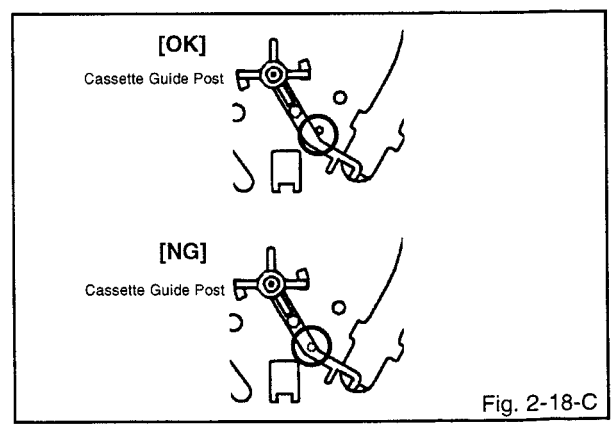


Fig. 2-18-C

DISASSEMBLY INSTRUCTIONS

3. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 3-1.)**

   NOTE

   Masking is carried out on all the parts located within 10 mm distance from IC leads.

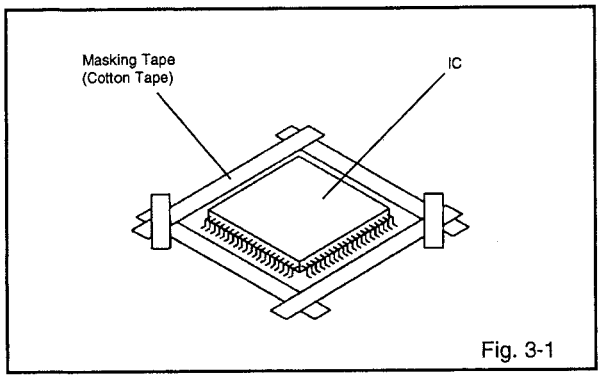


Fig. 3-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 3-2.)**

   NOTE

   Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.

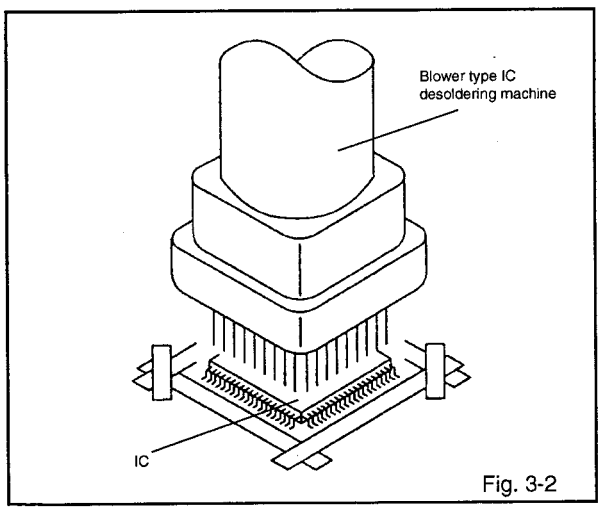


Fig. 3-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 3-3.)**

   NOTE

   Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

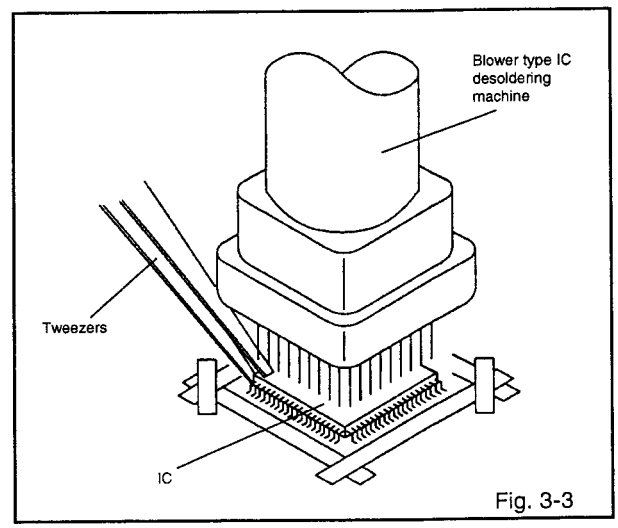


Fig. 3-3

4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 3-4.)**

   NOTE

   Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.

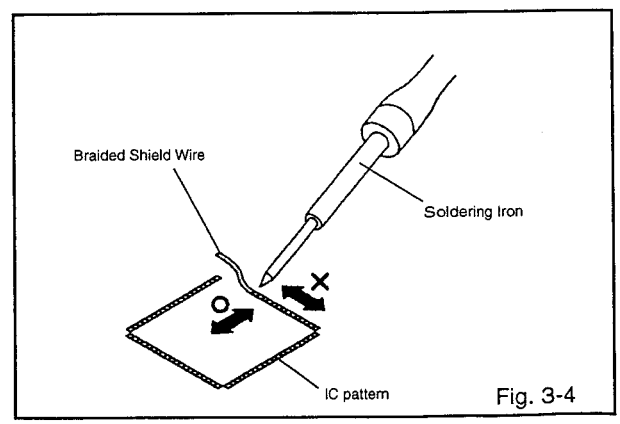


Fig. 3-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 3-5.)**

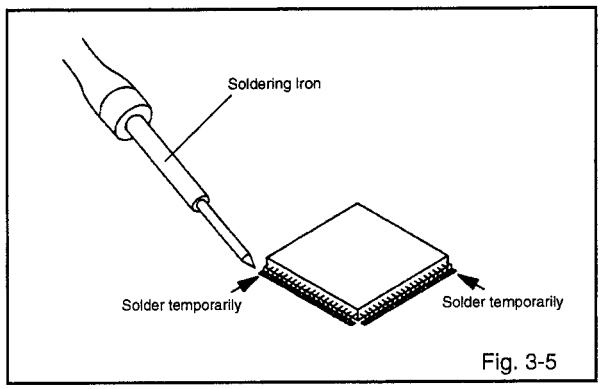


Fig. 3-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 3-6.)**

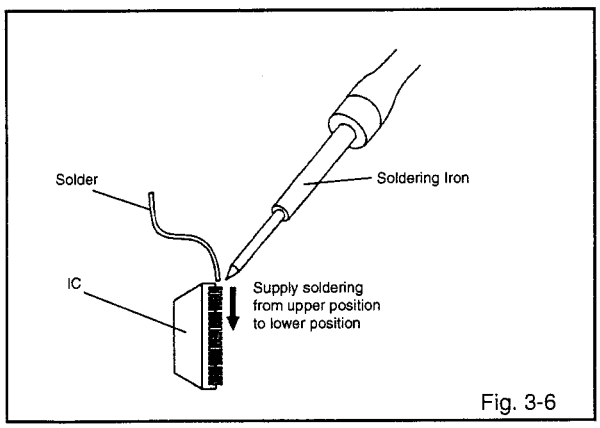


Fig. 3-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 3-7.)**

NOTE

Do not absorb the solder to excess.

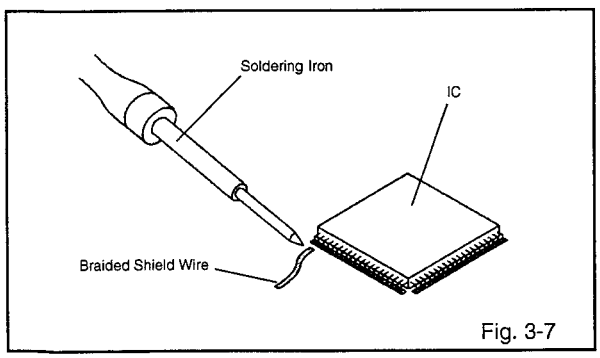


Fig. 3-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 3-8.)**

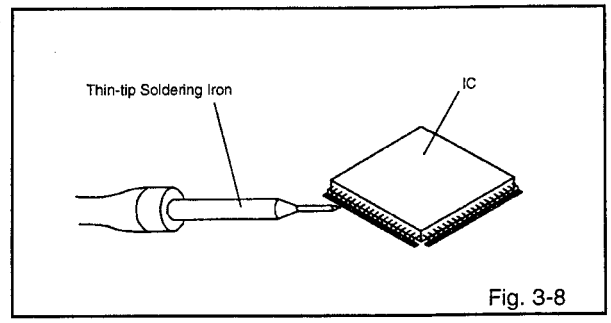


Fig. 3-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.
   Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	A/C	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	BGP	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	C	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	DATA (SY-CE)	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	E	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	F	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flipflop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	GEN	:	Generator
	GND	:	Ground
H	H.P.F	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	IC	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	KIL	:	Killer
L	L	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	M	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mecha State Switch
N	NC	:	Non Connection
	NR	:	Noise Reduction
O	OSC	:	Oscillator
	OPE	:	Operation
P	PB	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	R	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	S. CLK	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

ERROR CODE LIST

If the error indications are appeared on the FIP, check the abnormal points by using the table below.

Indications	Error contents
Error : 00	Remocon code error
Error : 01	Reel mecha error
Error : 02	Cylinder mecha error
Error : 03	Mecha state error
Error : 04	Capstan mecha error

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

Method	Operations
Press both PLAY button and CH UP button on the set for more than 2 seconds.	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC total hours.
While pressing the CH UP key on the set, press the FF key on the set for more than 2 seconds.	PLAY/REC total hours are displayed on the TV Monitor. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
While pressing the CH UP button on the set, press the STOP button on the set for more than 2 seconds during PLAY.	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT and the Reel sensor do not work and the deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING".

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.
Parts replacing time does not mean the life span for individual parts.
Also, long term storage or misuse may cause transformation and aging of rubber parts.
The following list means standard hours, so the checking hours depends on the conditions.

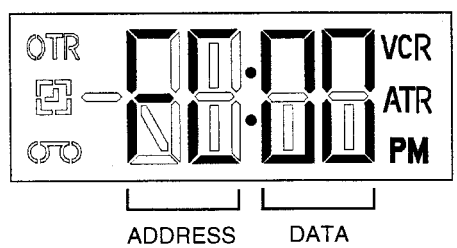
Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	●	●	●	●	Clean the Head

■ : Clean
● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

PLAY/REC total hours can be checked on the display.
Total hours are displayed in 16 system of notation.

1. Turn on the POWER.
2. While pressing the CH UP button on the set, press the FF button on the set for more than 2 seconds.
3. Adjust the ADDRESS to "FD" by FF or REW button and read the DATA.
   (This DATA becomes the thousands digit and hundreds digit value of the following formula.)
4. Adjust the ADDRESS to "FE" by FF or REW button and read the DATA.
   (This DATA becomes the tens digit and ones digit value of the following formula.)
5. After the confirmation of using hours, turn off the power.



(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

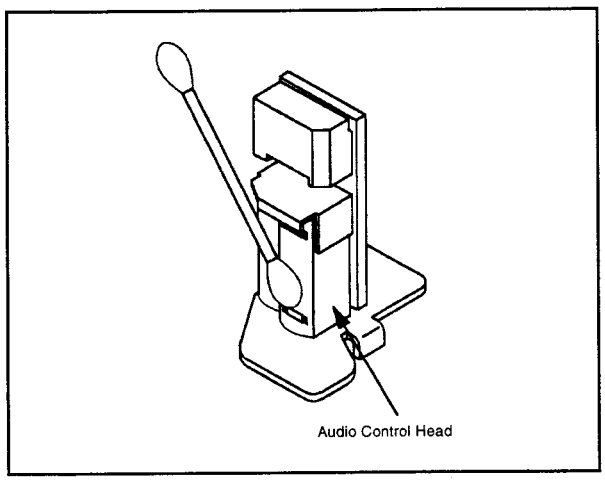
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with the cotton stick soaked by alcohol. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

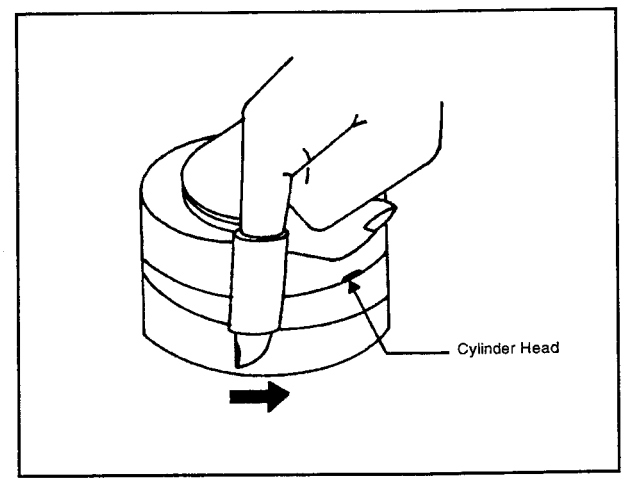
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head.
Use the chamois one by one.



WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
C0	B2	1A	00	00	00	F1	44	51	00	51	B2	9F	97	8E	0A	8A
D0	AB	E2	06	04	00	FF	00	00	71	9F	82	0A	42	35	63	56
E0	76	5E	08	F0	01	F3	00	00	00	00	00	5F	09	F0	0A	F3
F0	50	2F	DF	41	41	00	00	00	00	80	04	00	99	--	--	--

Table 1

1. Turn on the POWER.
2. While pressing the CH UP button on the set, press the FF button on the set for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.

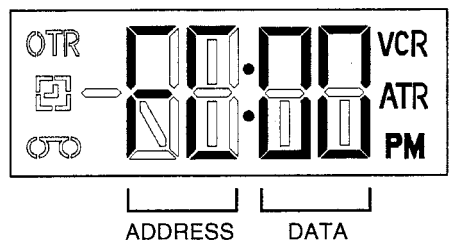
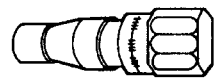
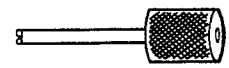
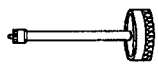
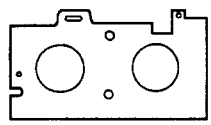
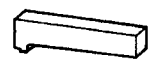
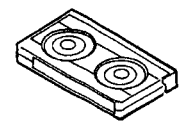
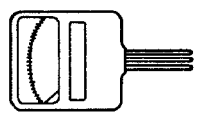


Fig. 1

3. ADDRESS is now selected and should "blink". Using the FF or REW button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using FF or REW button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

(For 2 head 1 speed model, 4 head model) VHS Alignment Tape JG001E (VP_1S-LI6^3) JG001F (VP_1S-CO1^3) JG001R (VP_1S-LI6^{3}H) JG001U (VP_1S-X6^3) 	**(For 2 head 2 speed model)** VHS Alignment Tape JG001C (VP_2S-LI6^3) JG001D (VP_2S-CO1^3) JG001V (VP_2S-X6^3) 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 	JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 (small) 
JG153 X Value Adjustment Screwdriver 	JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG100A Torque Tape (VHT-063) 
JG154 Cable 	Tentelometer 		

Ref. No.	Part No.	Parts Name	Remarks
JG001E	APJG001E00	VHS Alignment Tape	Monoscope, 6KHz **(For 2 head 1 speed model, 4 head model)**
JG001F	APJG001F00	VHS Alignment Tape	Color Bar, 1KHz **(For 2 head 1 speed model, 4 head model)**
JG001R	APJG001R00	VHS Alignment Tape	Hi-Fi Audio **(For Hi-Fi model)**
JG001U	APJG001U00	VHS Alignment Tape	X Value Adjustment **(For 2 head 1 speed model, 4 head model)**
JG001C	APJG001C00	VHS Alignment Tape	Monoscope, 6KHz **(For 2 head 2 speed model)**
JG001D	APJG001D00	VHS Alignment Tape	Color Bar, 1KHz **(For 2 head 2 speed model)**
JG001V	APJG001V00	VHS Alignment Tape	X Value Adjustment **(For 2 head 2 speed model)**
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG005	APJG005000	Post Adjustment Screwdriver	Guide Roller Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG100A	APJG100A00	Torque Tape (VHT-063)	Playback Torque, Back Tension Torque During Playback
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Short circuit between **TP1001** and **Ground** with the cable JG154.
   (The BOT, EOT and the Reel Sensor do not work and the deck can be operated without a cassette tape.)
2. In case of using a cassette tape, press the STOP/EJECT button to insert or eject a cassette tape.
   Turn on the power and re-check the cable before checking the trouble points.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024A)** on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig **(JG024A)** and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to 10(+2, -0)mm.
4. Adjust the other reel in the same way.

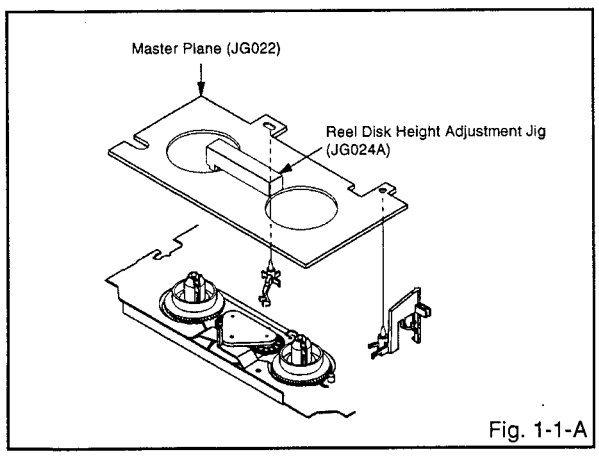


Fig. 1-1-A

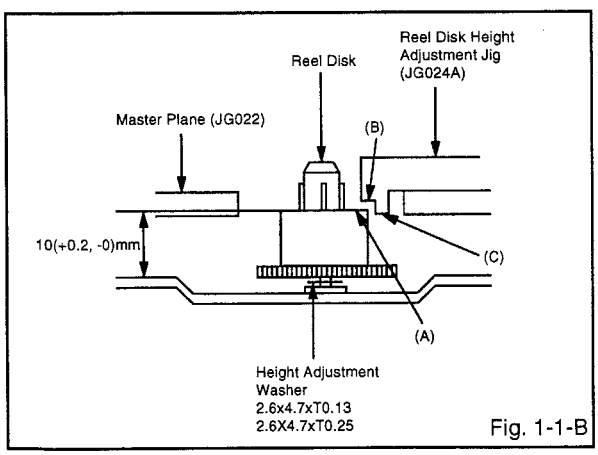


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

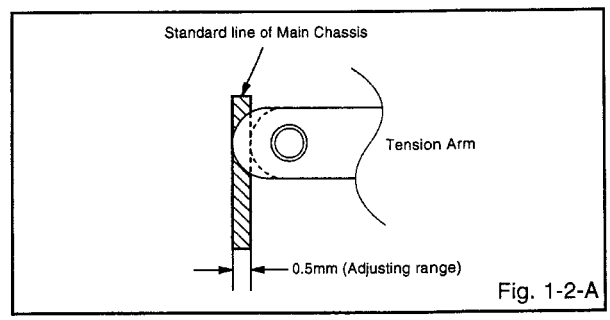
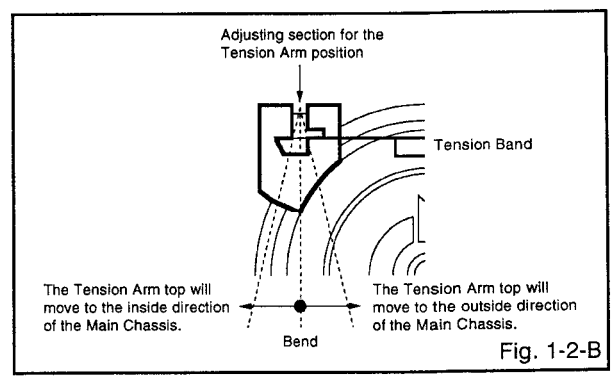


Fig. 1-2-A


Adjusting section for the Tension Arm position
Tension Band
The Tension Arm top will move to the inside direction of the Main Chassis.
The Tension Arm top will move to the outside direction of the Main Chassis.
Bend
Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (E-180) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE **(JG100A)**

1. After confirmation and adjustment of Tension Post position **(Refer to item 1-2)**, load the cassette type torque tape **(JG100A)** and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

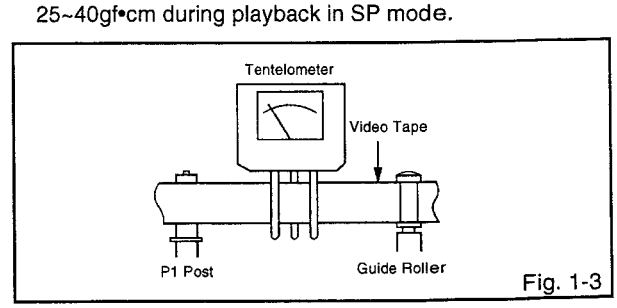


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Set to the Picture Search (Rewind) mode. **(Refer to Fig.1-4-B)**
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A.**
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Turn the Torque Gauge **(JG002F)** clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A.**
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge **(JG002E)** and Adapter **(JG002B)** on the T reel. Turn the Torque Gauge **(JG002E)** counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.

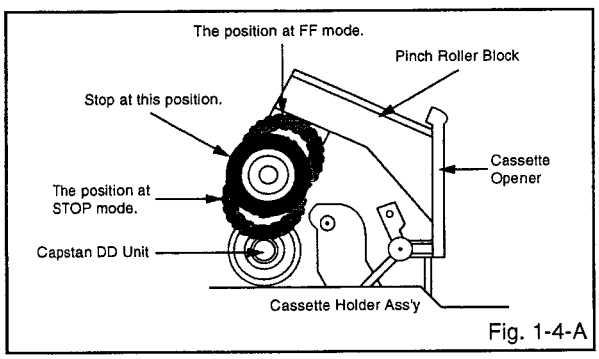


Fig. 1-4-A

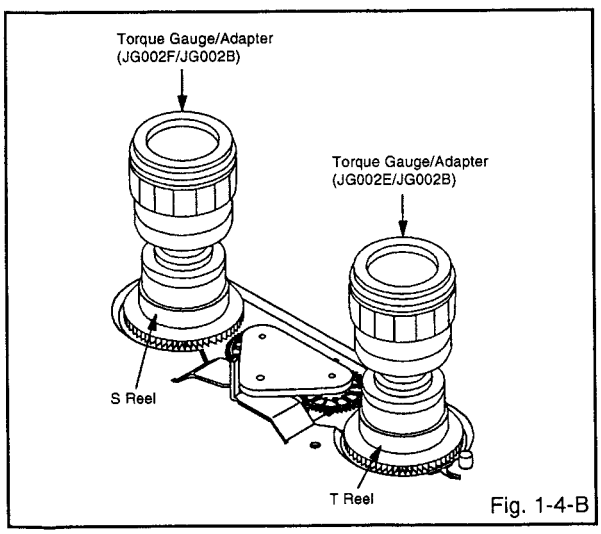


Fig. 1-4-B

NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape **(JG001C or JG001E)**. **(Refer to SERVICING FIXTURE AND TOOLS)**
2. Connect CH-1 of the oscilloscope to **TP4002 (Envelope)** and CH-2 to **TP4001 (SW Pulse)**.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
5. When observing the envelope, adjust the Adjusting Driver **(JG005)** slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in **Fig. 2-1-B**, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. **(Refer to the ELECTRICAL ADJUSTMENTS)**

NOTE

After adjustment, confirm and adjust A/C head. **(Refer to item 2-2)**

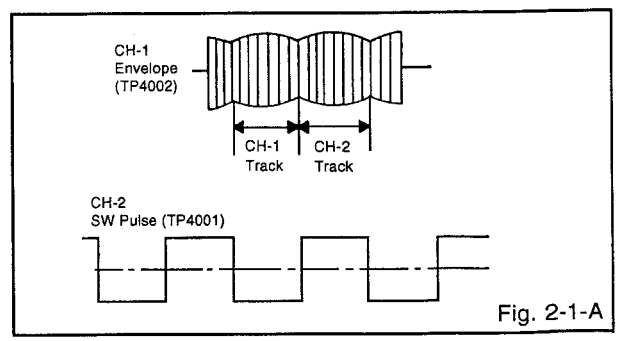


Fig. 2-1-A

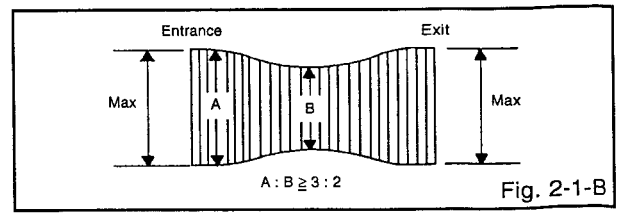


Fig. 2-1-B

MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/ CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape **(JG001C or JG001E). (Refer to SERVICING FIXTURE AND TOOLS)**
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Post as shown in **Fig. 2-2-A.**
   a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
   b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C.**
   c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

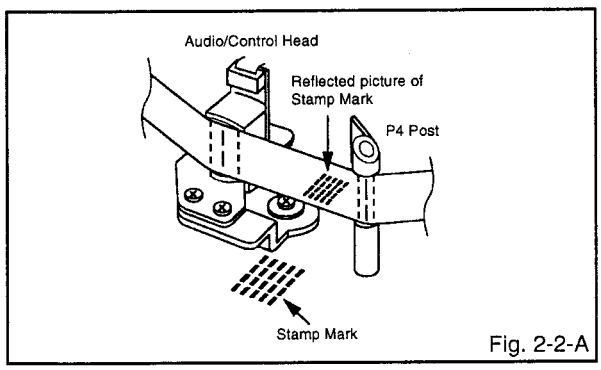


Fig. 2-2-A

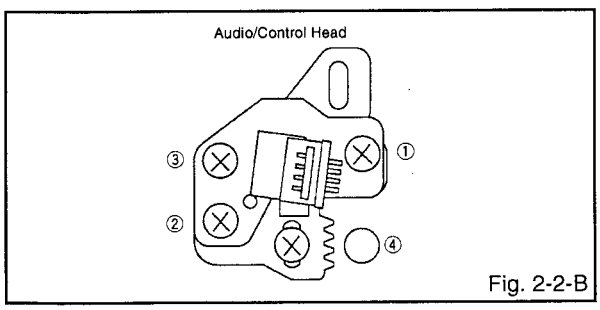


Fig. 2-2-B

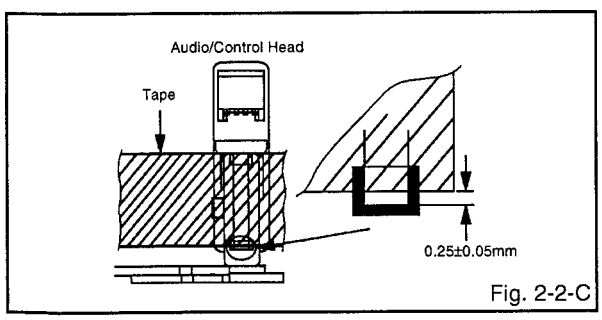


Fig. 2-2-C

2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP4002**, CH-2 to **TP4001** and CH-3 to **HOT side of Audio Out Jack.**
6. Playback the VHS Alignment Tape **(JG001U or JG001V). (Refer to SERVICING FIXTURE AND TOOLS)**
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver **(JG153)** to the ④ of **Fig. 2-2-B.** Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3.**

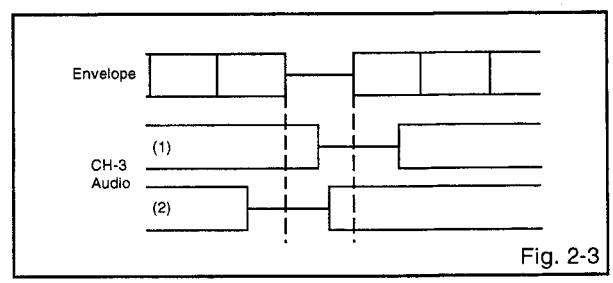


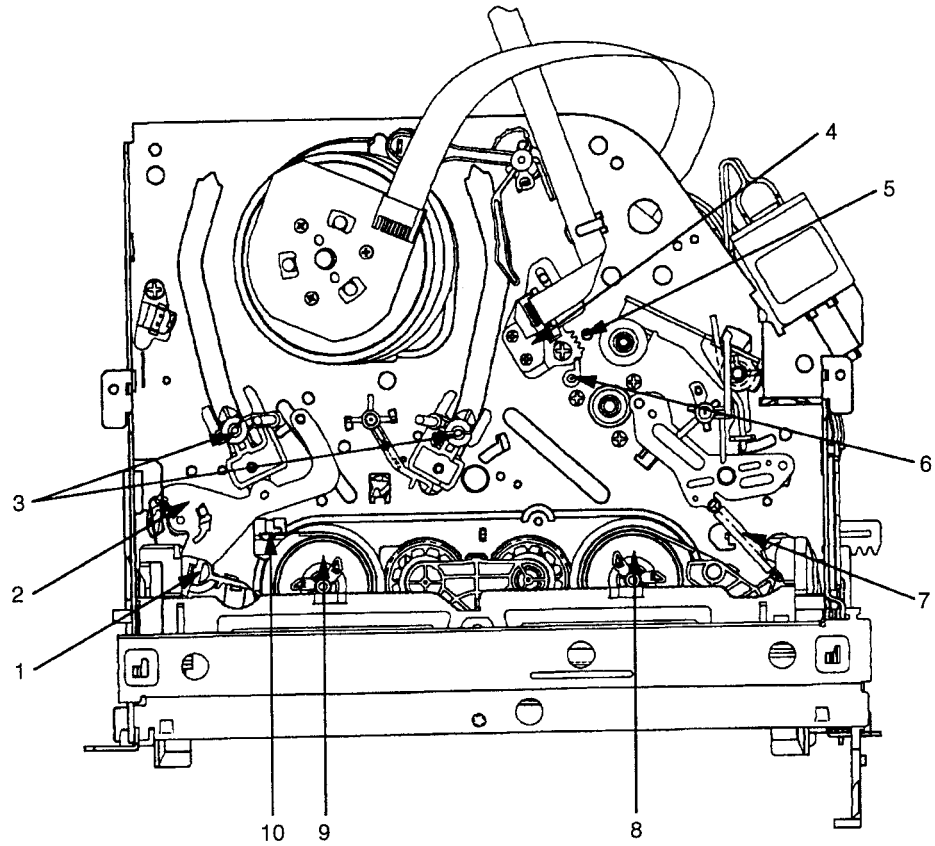
Fig. 2-3

2-4: CONFIRM HI-FI AUDIO (Hi-Fi model only)

1. Connect CH-1 of the oscilloscope to **TP4002** and CH-2 to the **Hi-Fi Audio Out Jack.**
2. Playback the VHS Alignment Tape **(JG001R). (Refer to SERVICING FIXTURE AND TOOLS)**
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the Tracking Up button and count number of steps which the audio output is changed from Hi-Fi (10KHz) to MONO (6KHz).
5. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
6. Press the Tracking Down button and count number of steps which the audio output is changed from Hi-Fi (10KHz) to MONO (6KHz).
7. If the difference are more than 3 steps, set the X Value adjustment driver **(JG153)** to ④ of **Fig. 2-2-B.** Change the X Value and adjust it so that the value becomes within 2 steps.

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



1. Tension Connect
2. Tension Arm
3. Guide Roller
4. Audio/Control Head
5. X value adjustment driver hole
6. P4 Post
7. T Brake Spring
8. T Reel
9. S Reel
10. Adjusting section for the Tension Arm position

ELECTRICAL ADJUSTMENTS

Read and perform this adjustment when repairing the circuits or replacing electrical parts or PCB assemblies.

1. BASIC ADJUSTMENT

CAUTION

When replacing IC's or transistors, use only specified silicon grease **(YG6260M).**
(To prevent the damage to IC's and transistors.)

1-1: PG SHIFTER

CONDITIONS

MODE-PLAYBACK
Input Signal-Alignment Tape **(JG001R)**

INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to **TP4001** and CH-2 to **pin 19 of J4501.**
2. Playback the alignment tape. **(JG001R)**
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press both CH UP button and STOP button on the set for more than 2 seconds. If the indicator ATR disappear's, the adjustment is finished. **(Refer to Fig. 1-1-A, B)**

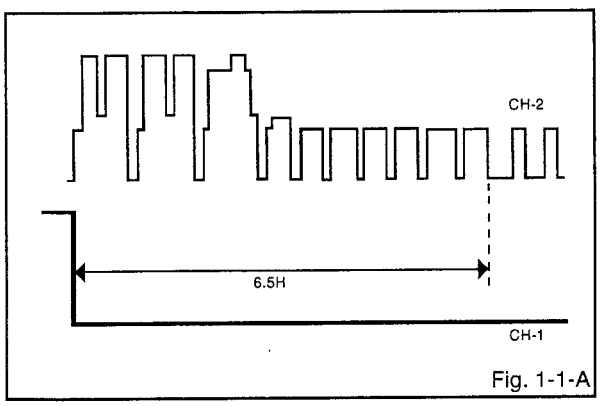


Fig. 1-1-A

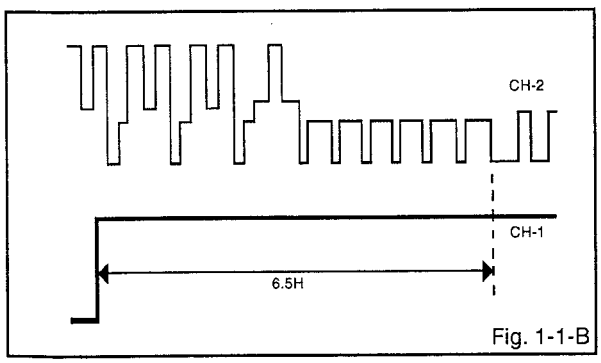


Fig. 1-1-B

1-2: PB-Y LEVEL

CONDITIONS

MODE-PLAYBACK
Input Signal-Alignment Tape **(JG001F)**

INSTRUCTIONS

1. Connect the oscilloscope to **pin 19 of J4501** through 75 ohm resistor.
2. Playback the alignment tape. **(JG001F)**
3. Check if the VIDEO OUTPUT LEVEL is 1.05 ± 0.15Vp-p. **(Refer to Fig. 1-2)**

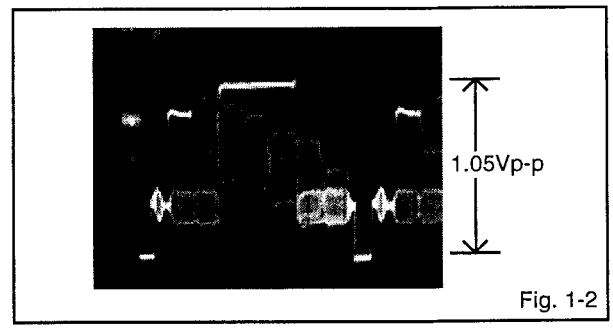


Fig. 1-2

1-3: E-E LEVEL

CONDITIONS

MODE-STOP
Input Signal-PAL Color Bar

INSTRUCTIONS

1. Connect the color bar generator to **pin 20 of J4501.**
2. Connect the oscilloscope to **pin 19 of J4501** through 75 ohm resistor.
3. Check if the VIDEO OUTPUT LEVEL is 1.05 ± 0.15Vp-p. **(Refer to Fig. 1-3)**

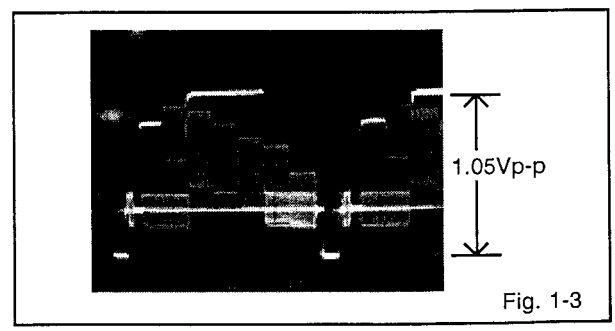


Fig. 1-3

1-4: E-E AUDIO LEVEL

CONDITIONS

MODE-STOP
Input Signal-Audio Signal: 1KHz, 500mVrms
Input Select-AV

INSTRUCTIONS

1. Connect the audio generator to **pins 2 and 6 of J4501.**
2. Connect the AC voltmeter to **pins 1 and 3 of J4501** through 47K ohm resistor.
3. Check if the AUDIO OUTPUT LEVEL is 500(mVrms) ± 2(dB).

ELECTRICAL ADJUSTMENTS

1-5: PB AUDIO LEVEL

CONDITIONS

MODE-Self (RECORD and PLAYBACK)
Input Signal-Audio Signal: 1KHz, 500mVrms
Video Signal: PAL Color Bar
Input Select-AV

INSTRUCTIONS

1. Connect the color bar generator to **pin 20 of J4501.**
2. Connect the audio generator to **pins 2 and 6 of J4501.**
3. Connect the AC voltmeter to **pins 1 and 3 of J4501** through 47K ohm resistor.
4. After the input of audio signal and video signal, proceed with the recording.
5. Playback the recorded section and check if the AUDIO OUTPUT LEVEL is 500(mVrms) ± 2(dB).

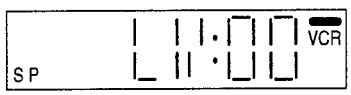
1-6: SEPARATION

CONDITIONS

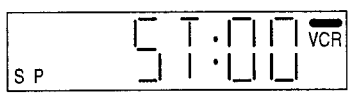
MODE-STOP
AUDIO OUTPUT SW: STEREO POSITION
Input Signal-RF Signal

INSTRUCTIONS

1. Receive the audio signal (L ch: No Signal, R ch: 1KHz).
2. Connect the AC voltmeter to **AUDIO OUT (L ch).**
3. Press both CH UP button and STOP button on the set for more than 3 seconds.
   The fluorescent display on the set displays as below.



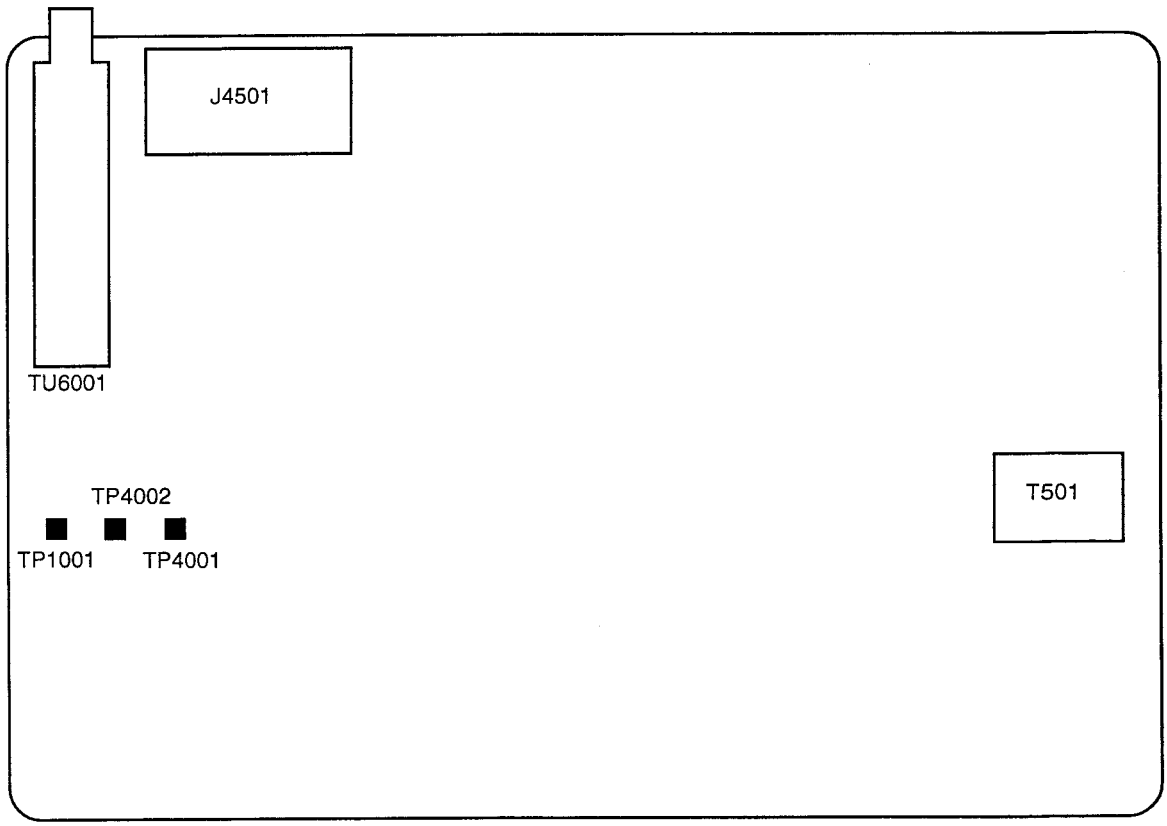
4. Press the F.FWD or REW button on the remote control.
   The fluorescent display on the set displays as below.



5. Adjust the F.FWD and REW button on the remote control until output signal is minimum. (more than 25dB)
6. Press both CH UP button and STOP button of the set together to complete the adjustment.
7. Receive the audio signal (L ch: 1KHz, R ch: No Signal).
8. Connect the AC voltmeter to **AUDIO OUT (R ch).**
9. Repeat steps 3~6.

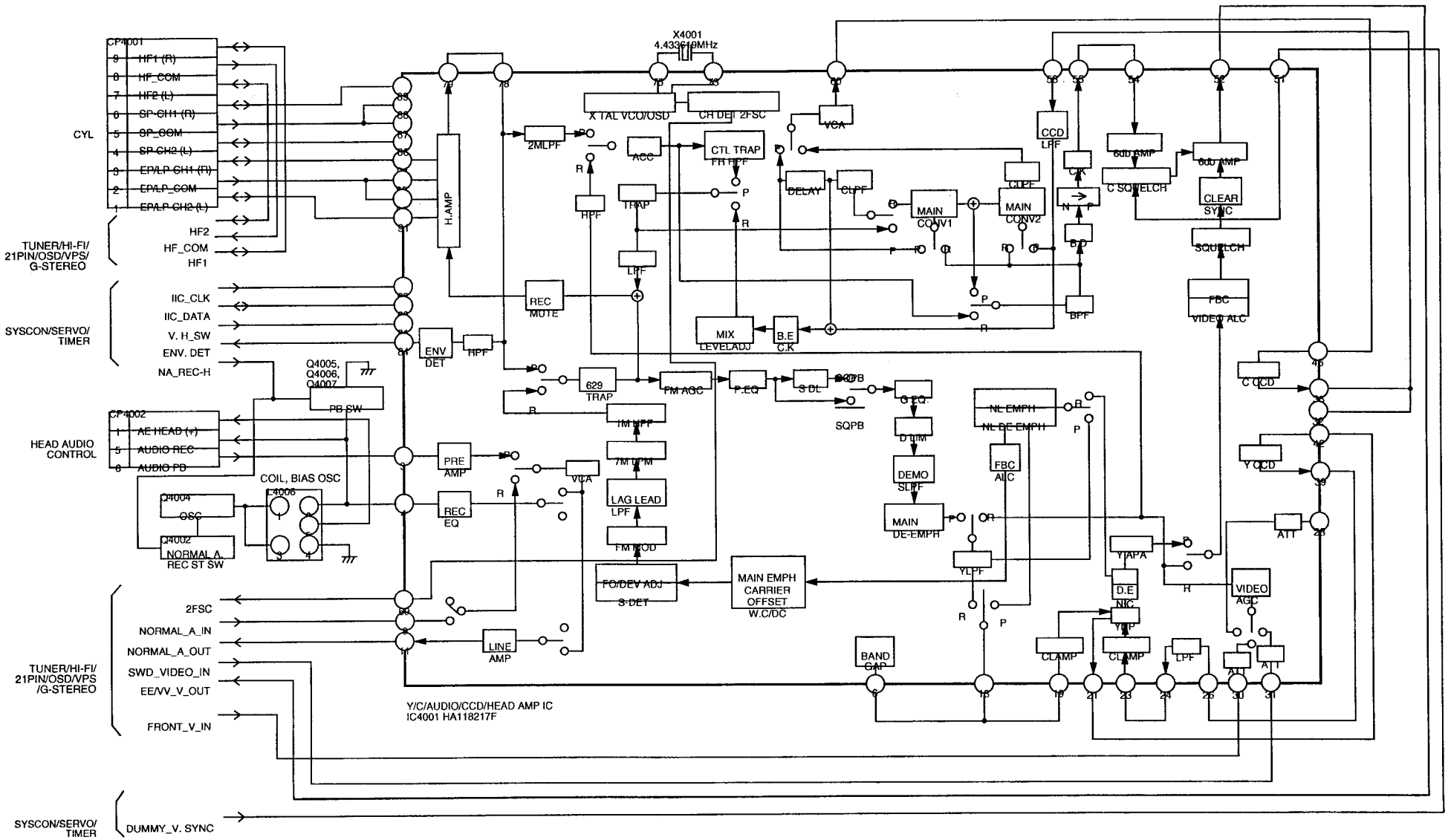
ELECTRICAL ADJUSTMENTS

2. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE

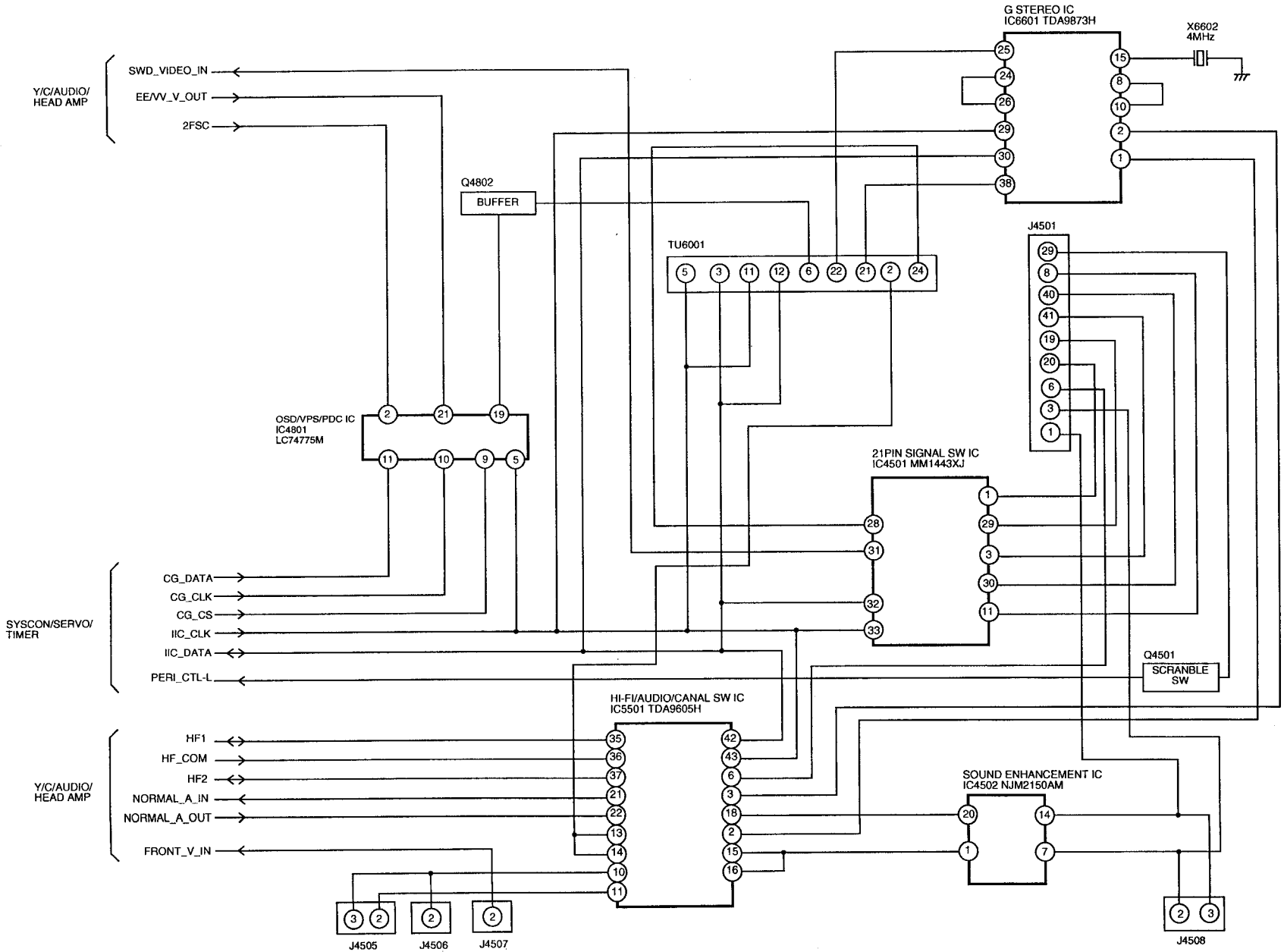


SYSCON PCB

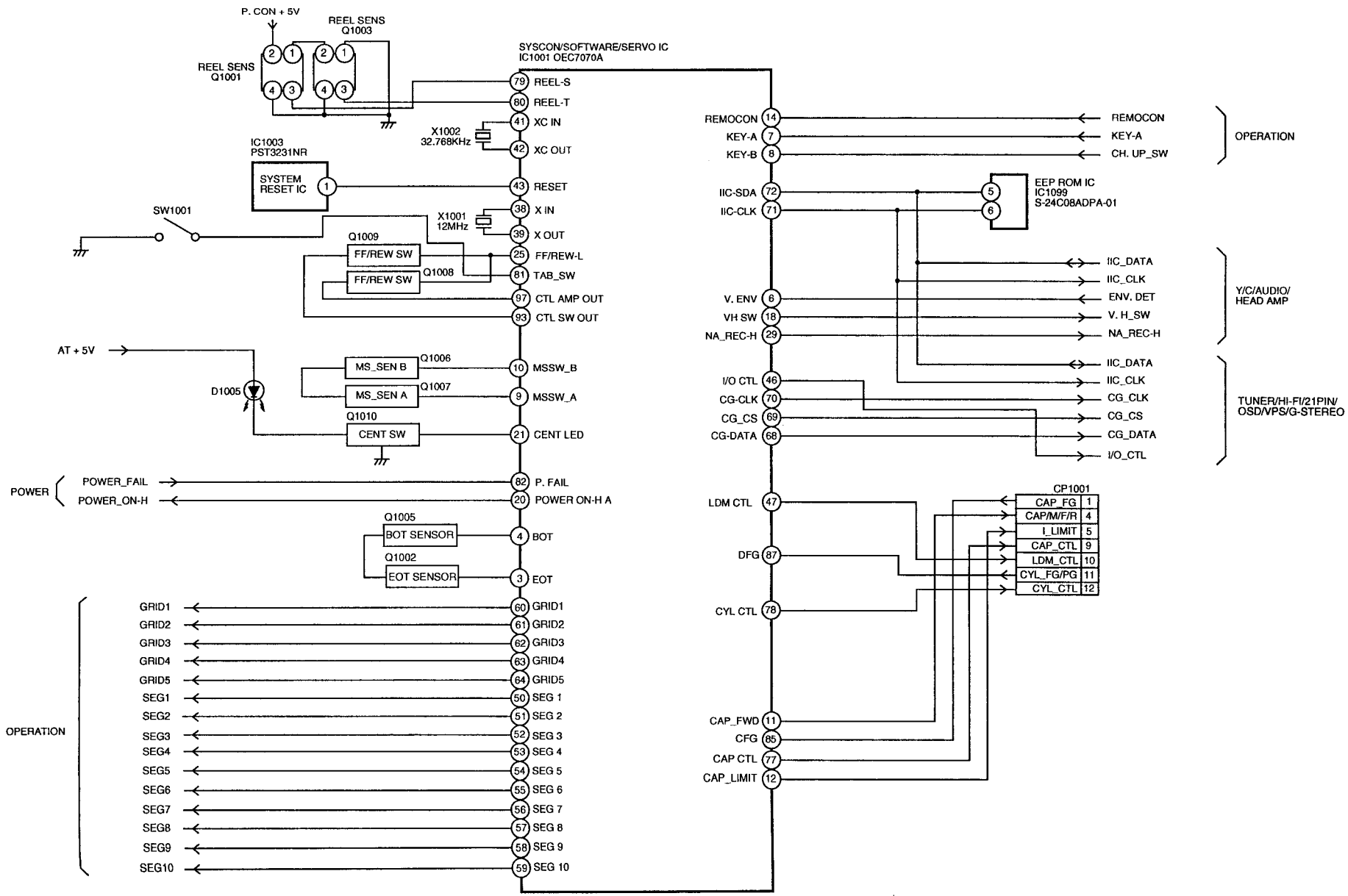
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM



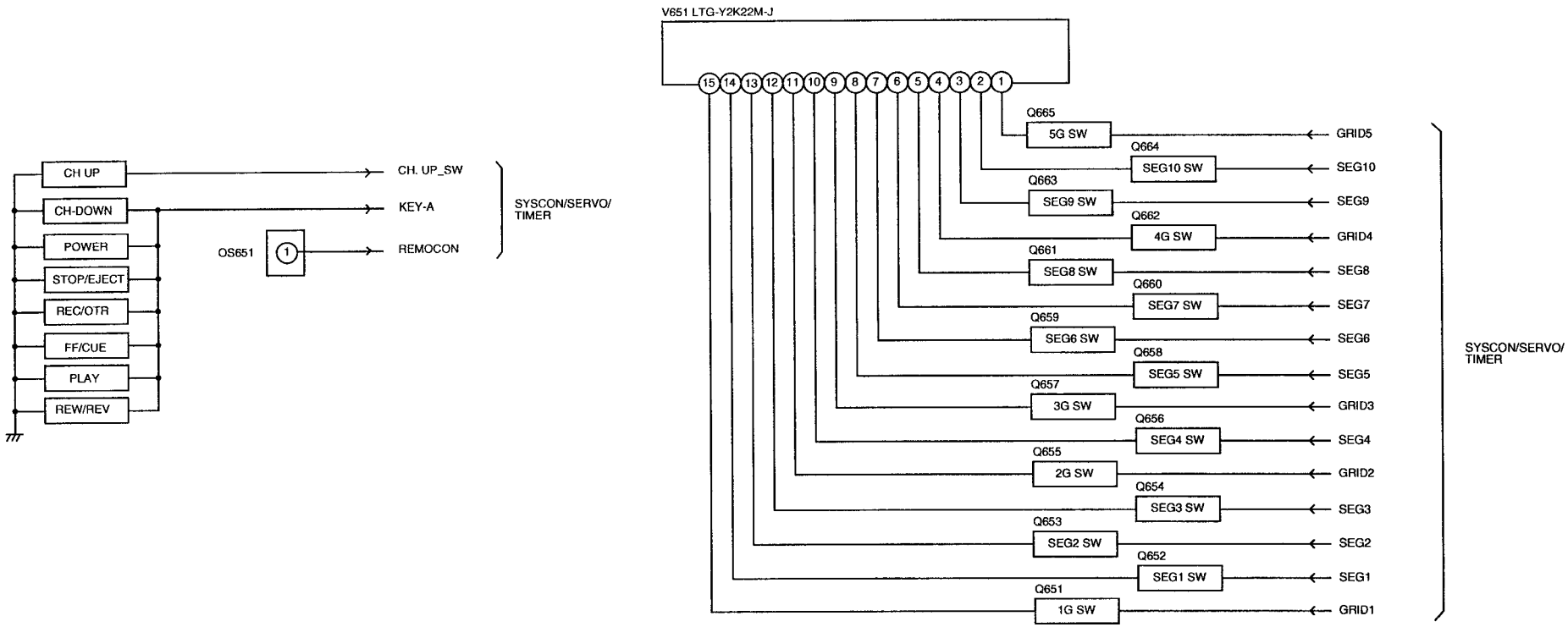
TUNER/HI-FI/21PIN/OSD/VPS/G-STEREO BLOCK DIAGRAM



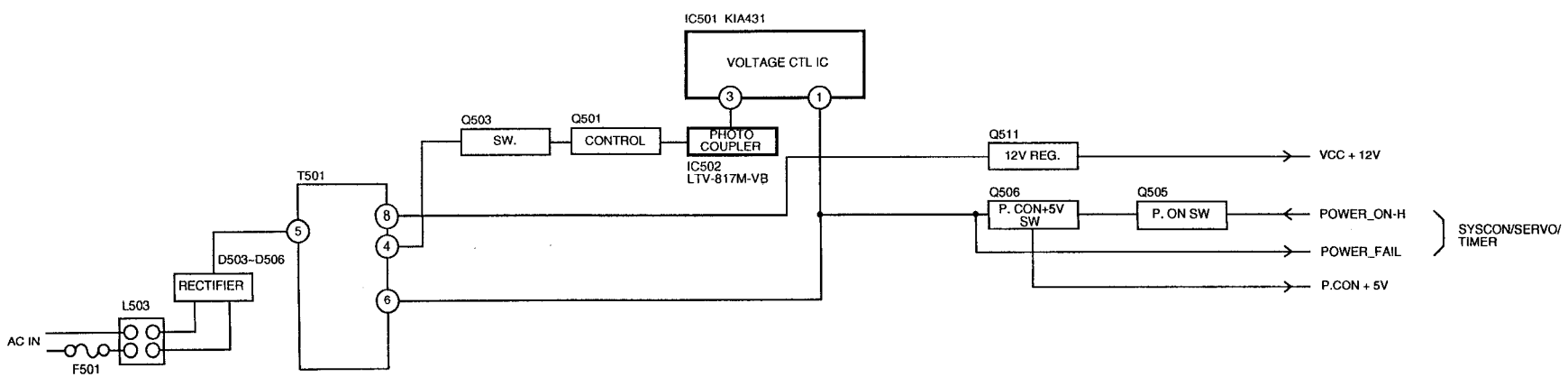
SYSTEM CONTROL/SERVO/TIMER BLOCK DIAGRAM



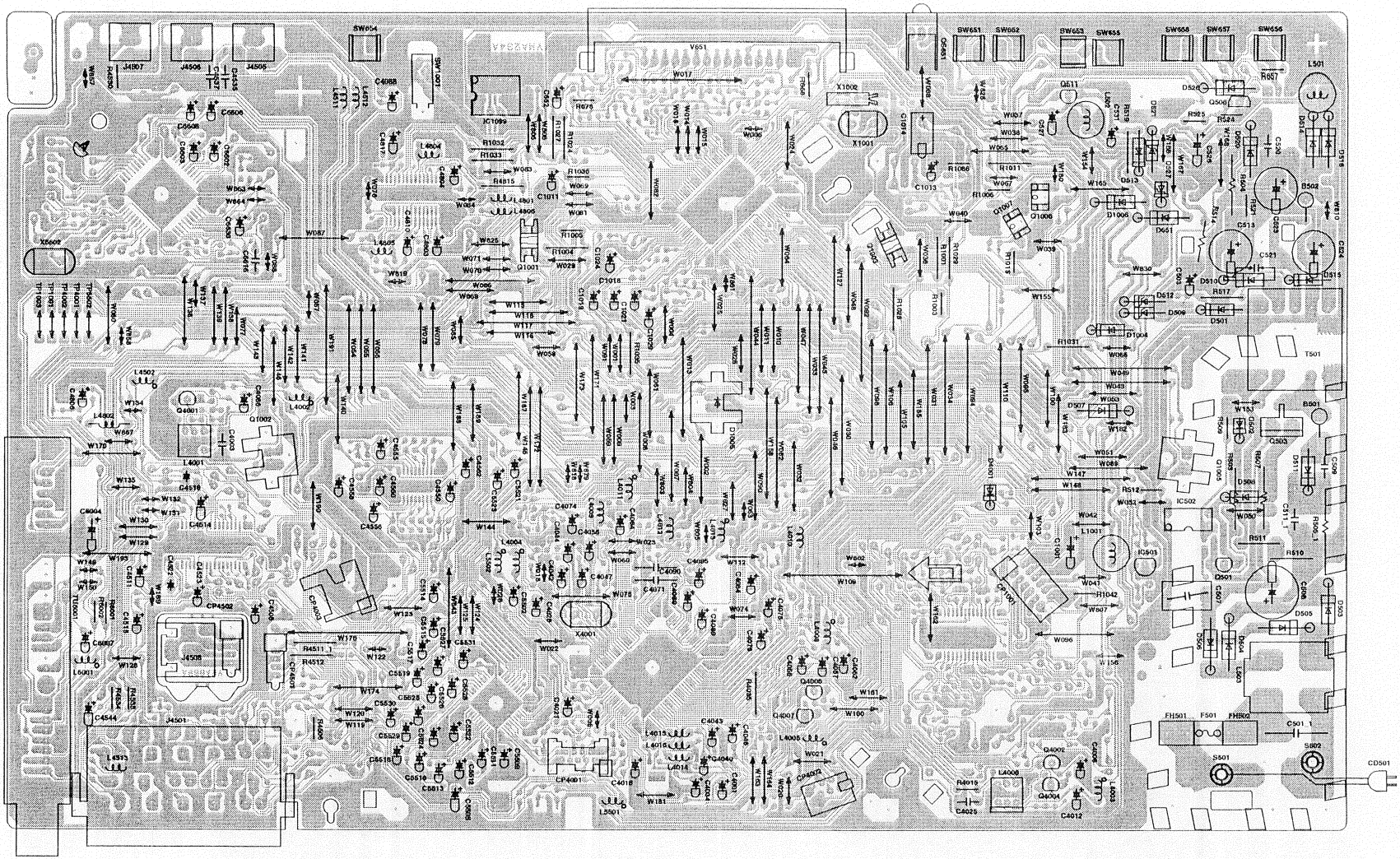
OPERATION BLOCK DIAGRAM



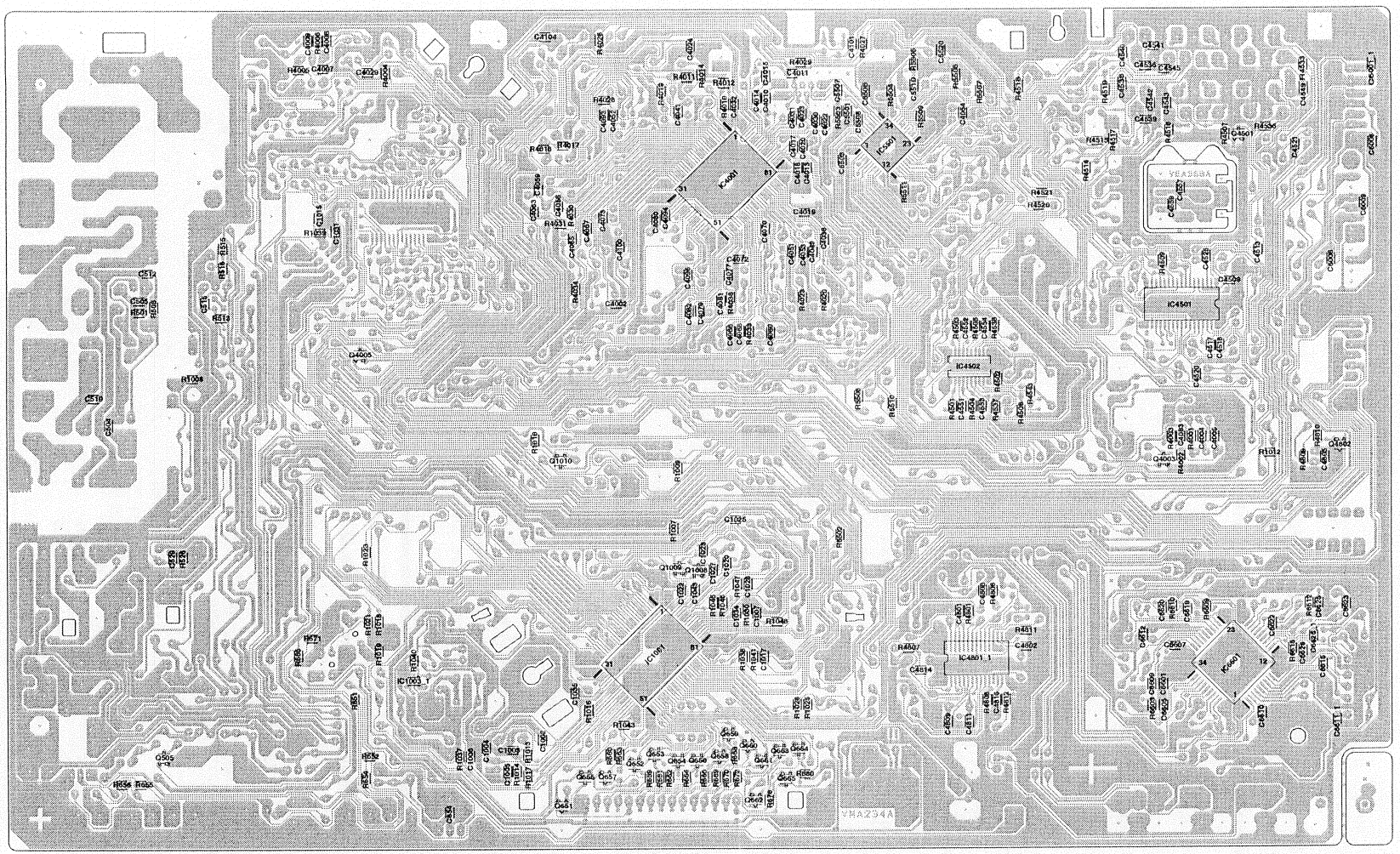
POWER BLOCK DIAGRAM



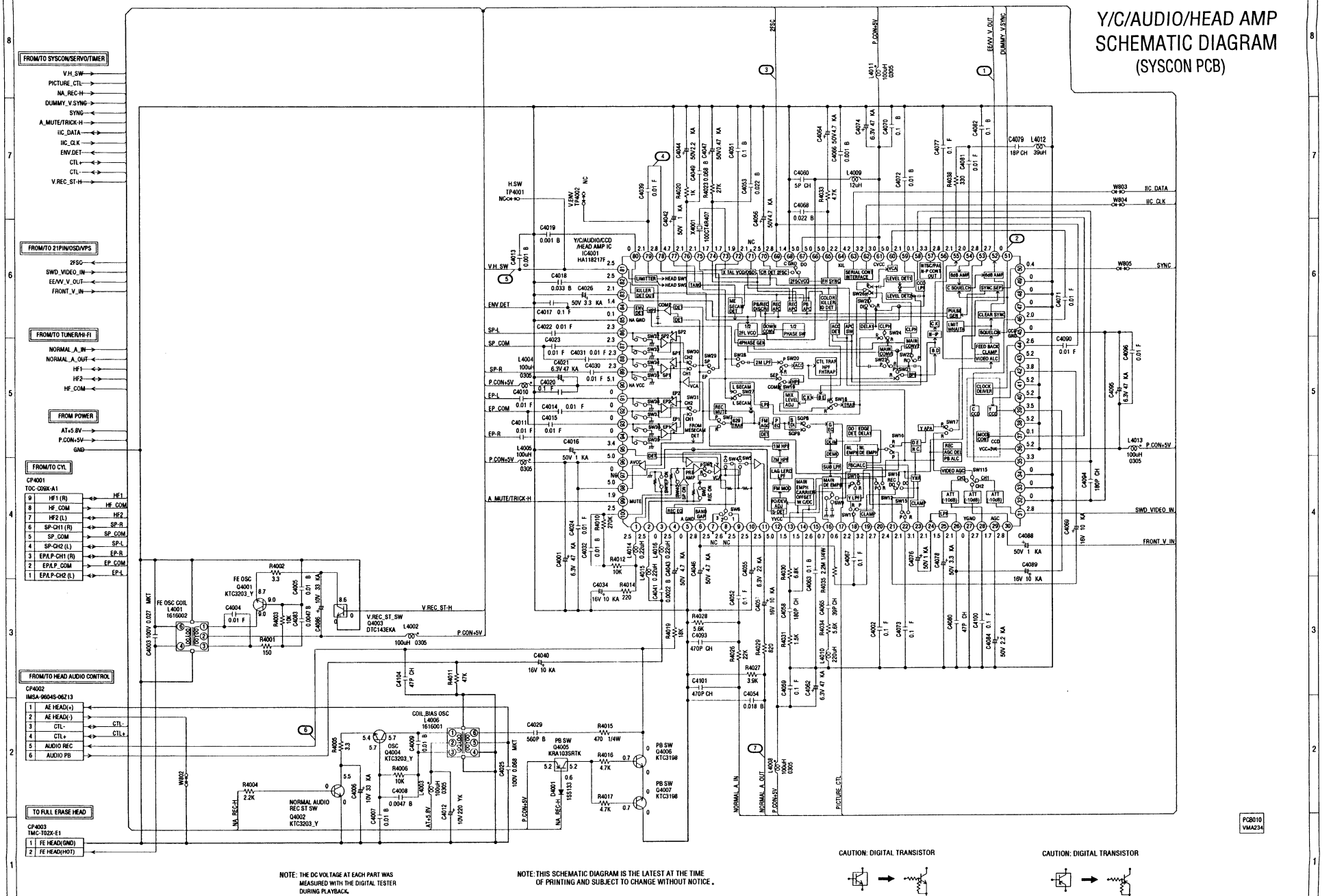
PRINTED CIRCUIT BOARDS
SYSCON/AUDIO (INSERTED PARTS)
SOLDER SIDE



PRINTED CIRCUIT BOARDS
SYSCON/AUDIO (CHIP MOUNTED PARTS)
SOLDER SIDE



Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM (SYSCON PCB)

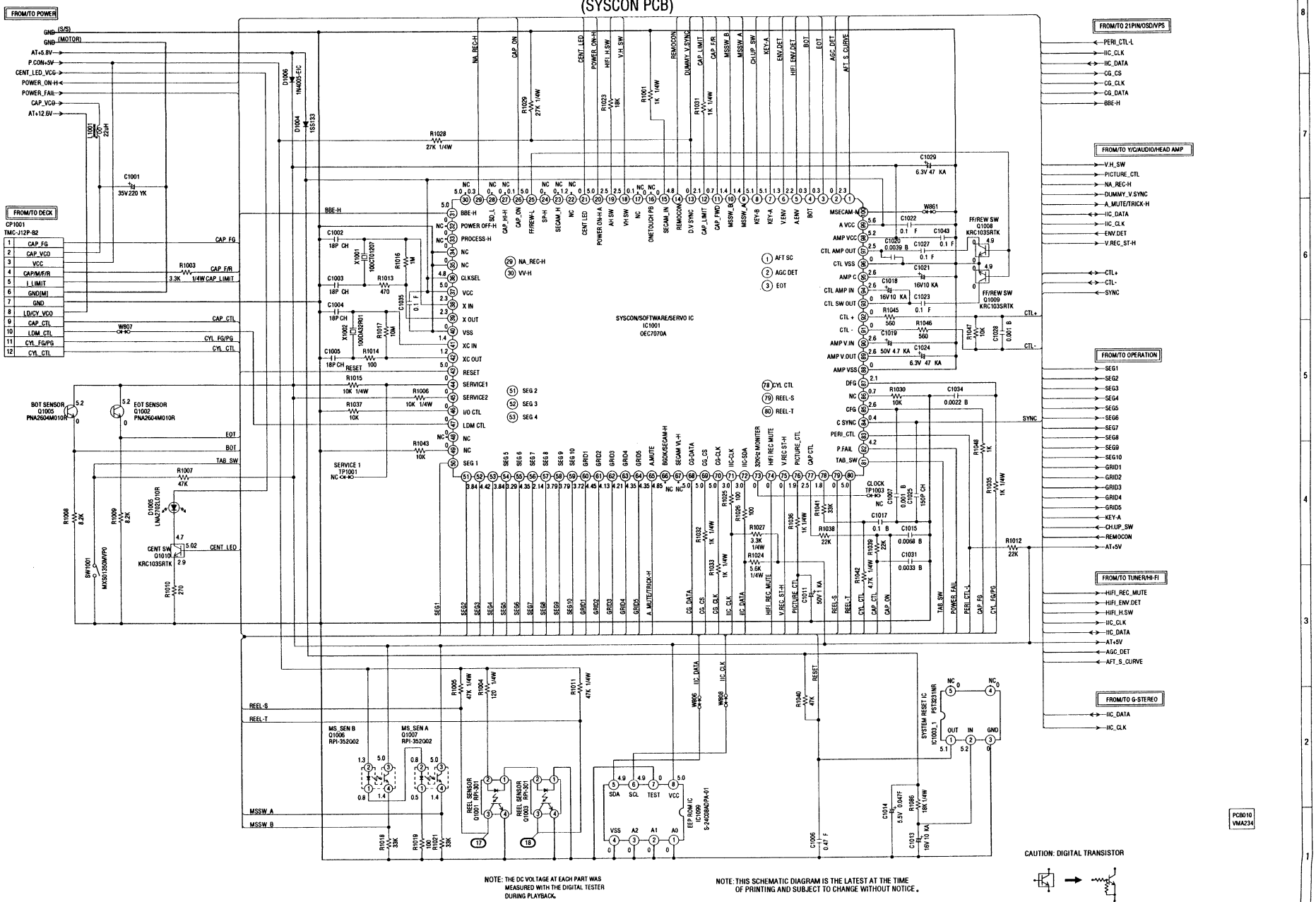


NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

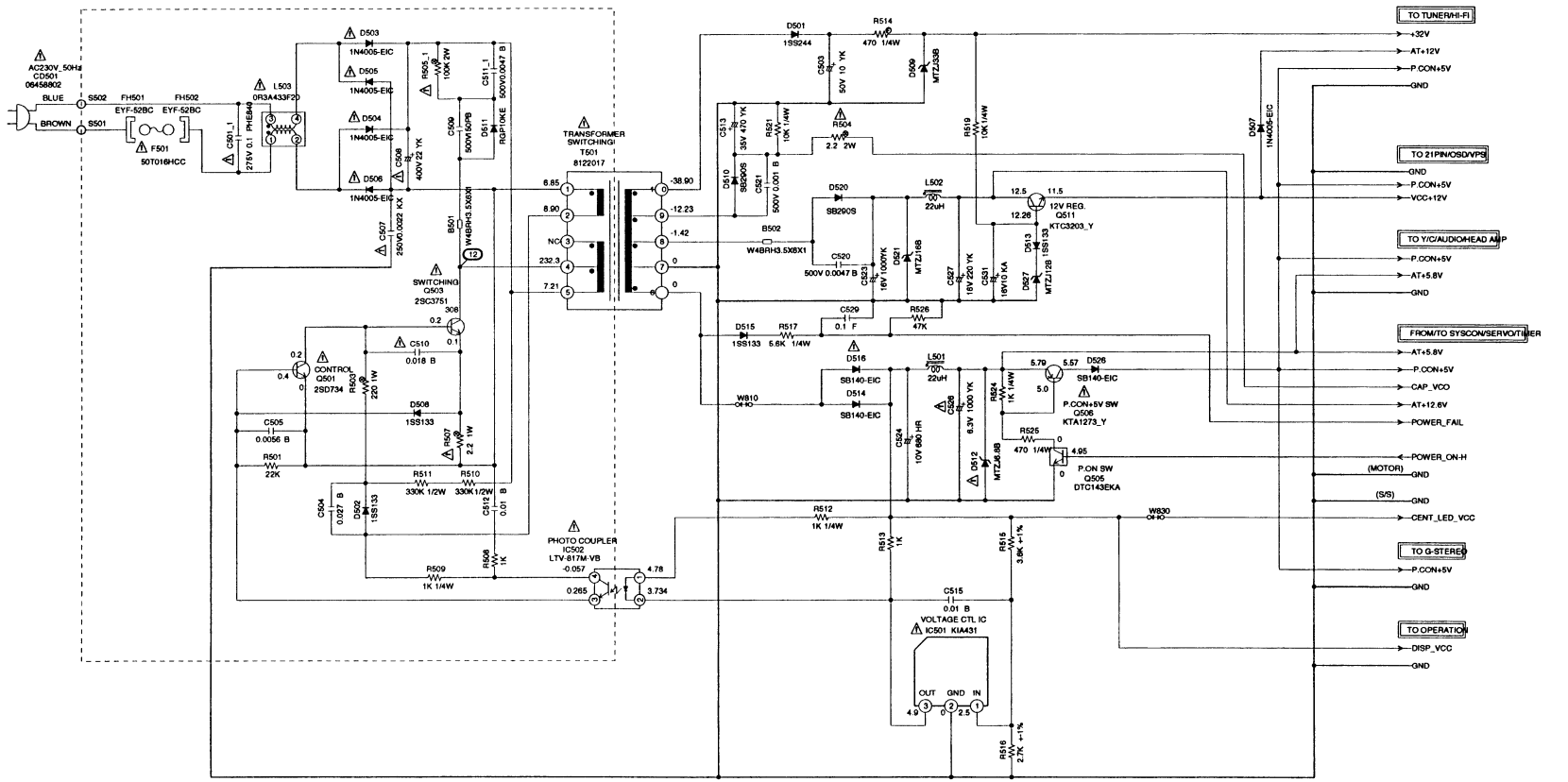
SYSTEM CONTROL/SERVO/TIMER SCHEMATIC DIAGRAM

(SYSCON PCB)



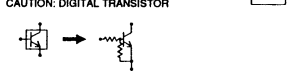
POWER SCHEMATIC DIAGRAM

(SYSCON PCB)



PCB010
VMA234

CAUTION: DIGITAL TRANSISTOR



CAUTIONSINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY

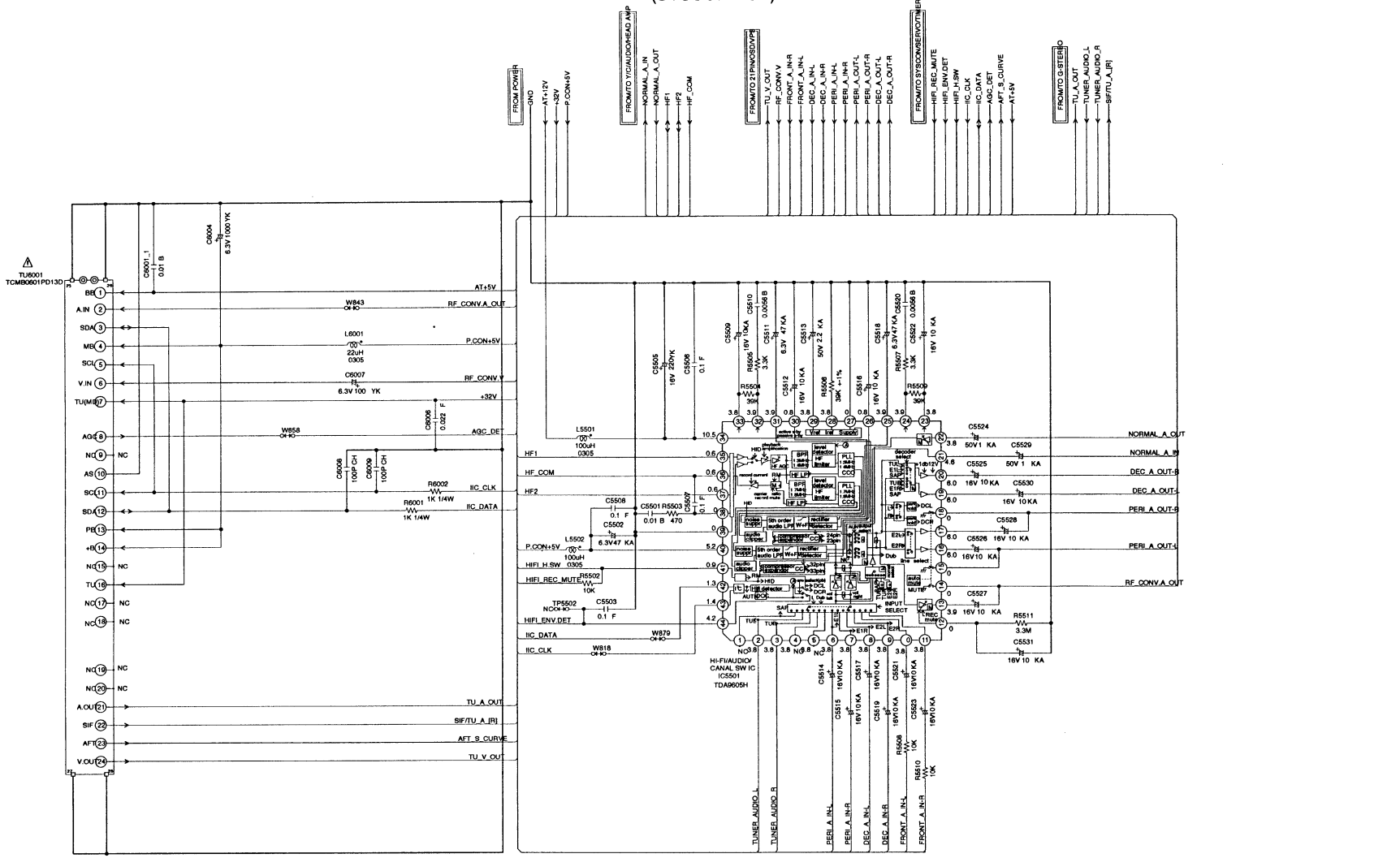
ATTENTIONLES PIECES REPAREES PAR ⚠ NETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

NOTETHE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

NOTETHIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

TUNER/HI-FI SCHEMATIC DIAGRAM

(SYSCON PCB)



PCB010
VMA234

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

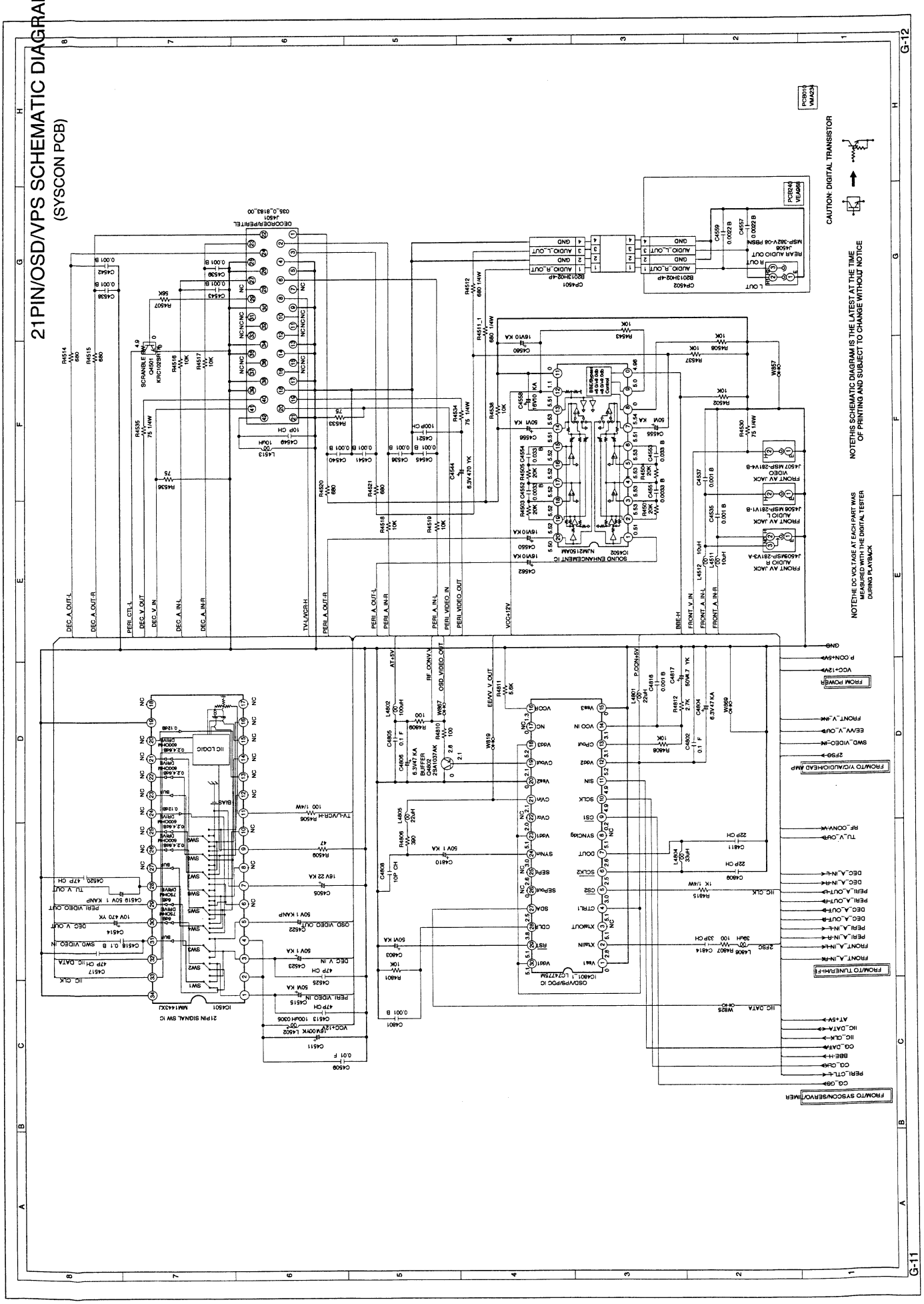
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION: SINCE THESE PARTS MARKED ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION: LES PIECES REPAREES PAR ⚠ NE TANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES RIECES

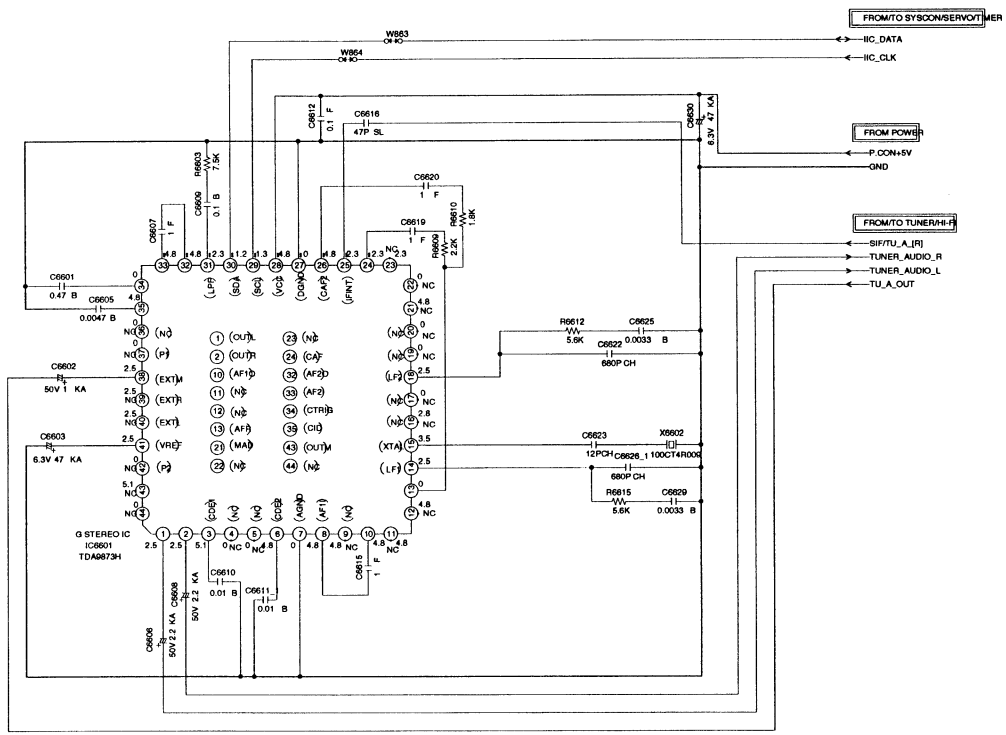
21PIN/OSD/VPS SCHEMATIC DIAGRAM

(SYSCON PCB)


CAUTION: DIGITAL TRANSISTOR
NOTE:THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE
NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK
DECODER/PERITEL
SCRAMBLE
21PIN SIGNAL SW IC
SOUND ENHANCEMENT IC
OSD/VPS/PDC IC
FRONT AV JACK
REAR AUDIO OUT
FRONT AV JACK AUDIO R
FRONT AV JACK AUDIO L
FRONT AV JACK VIDEO
FROM/TO SYSCON/SERVO/MER
FROM/TO TUNER/H-F
FROM/TO V/C/AUDIO/HEAD AMP
FROM POWER
G-12
G-11

G-STEREO SCHEMATIC DIAGRAM

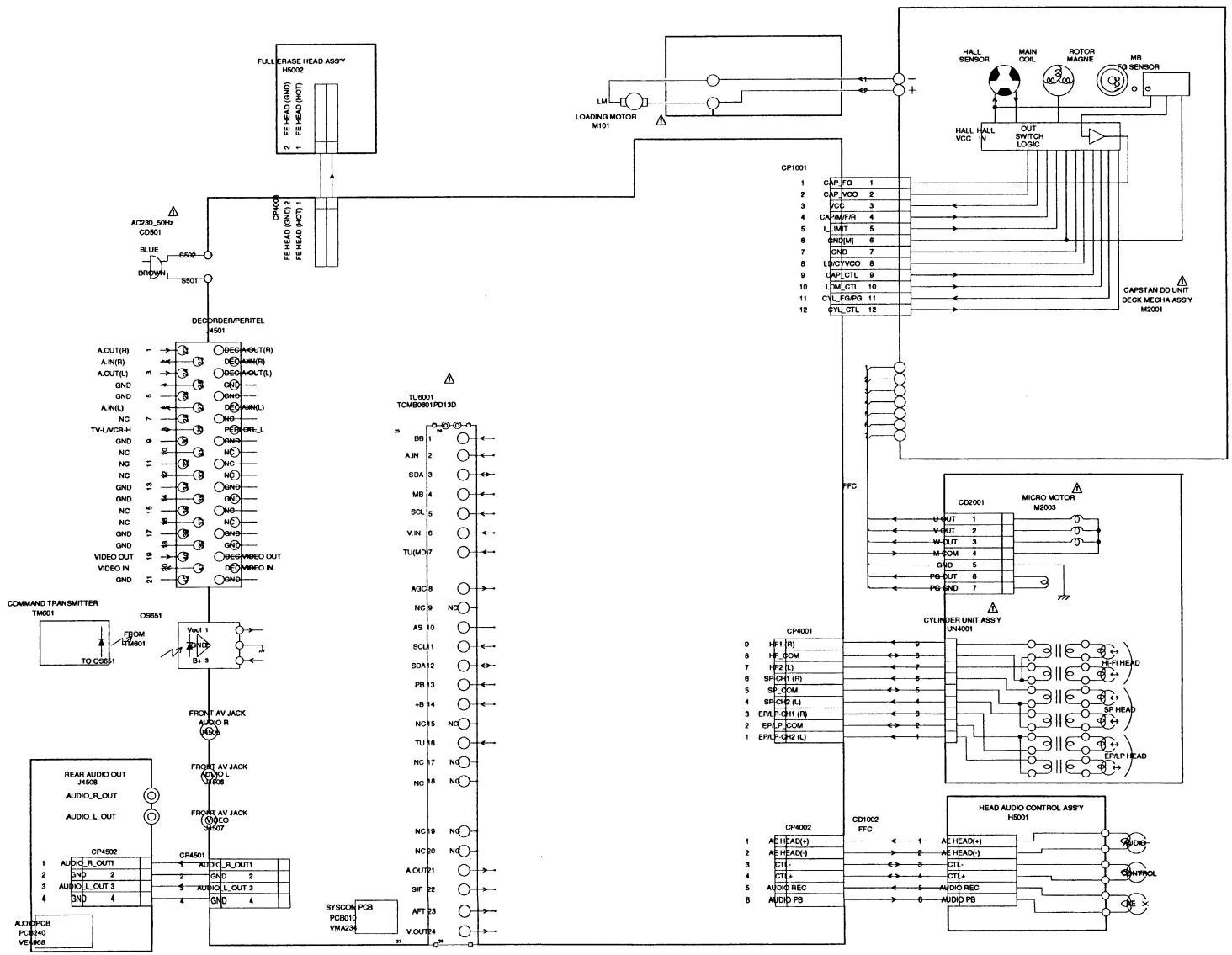
(SYSCON PCB)



NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

NOTE:THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

INTERCONNECTION DIAGRAM



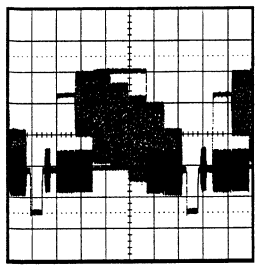
CAUTIONSINCE THESE PARTS MARKED BARE ⚠
CRITICAL FOR SAFETY,USE ONES
DESCRIBED IN PARTS LIST ONLY .

ATTENTIONLES PIECES REPAREES PAR U ETAT⚠
DANGEREUSES AN POINT DE VUE SECURITE
N'UTILISER QUE CELLS DECRITES
DANS LA NOMENCLATURE DES PIECES .

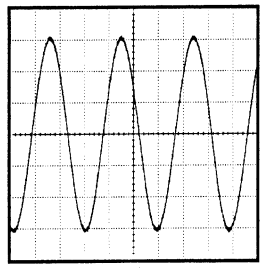
NOTETHIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

WAVEFORMS

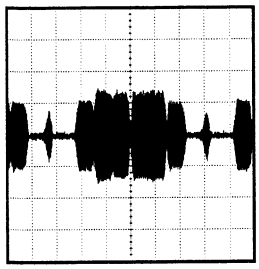
Y/C/AUDIO/HEAD AMP



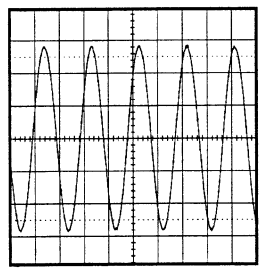
① REC
0.5V 10μs/div



⑥ REC
10V 5μs/div

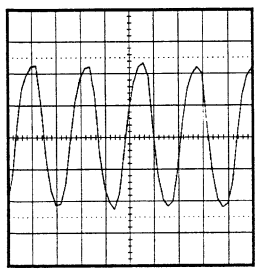


② PB
200mV 10μs/div

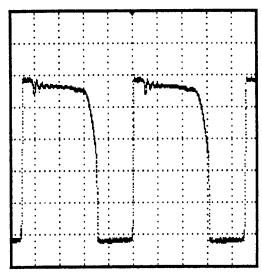


⑦ REC, PB
200mV 0.5ms/div

POWER

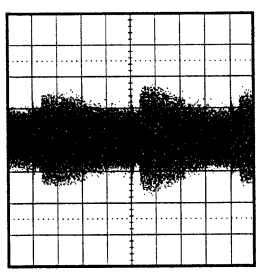


③ POWER ON
100mV 50ns/div

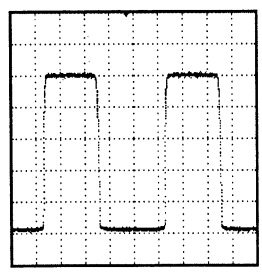


⑫ PB
2μs 50.0Vdiv

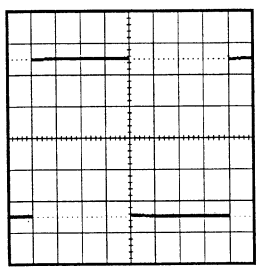
SYSCON/SERVO/TIMER



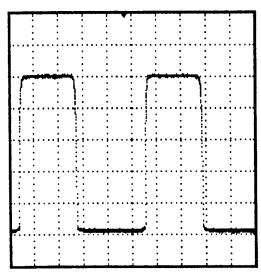
④ PB
100mV 5ms/div



⑰ PB
200ms 1.0V/div



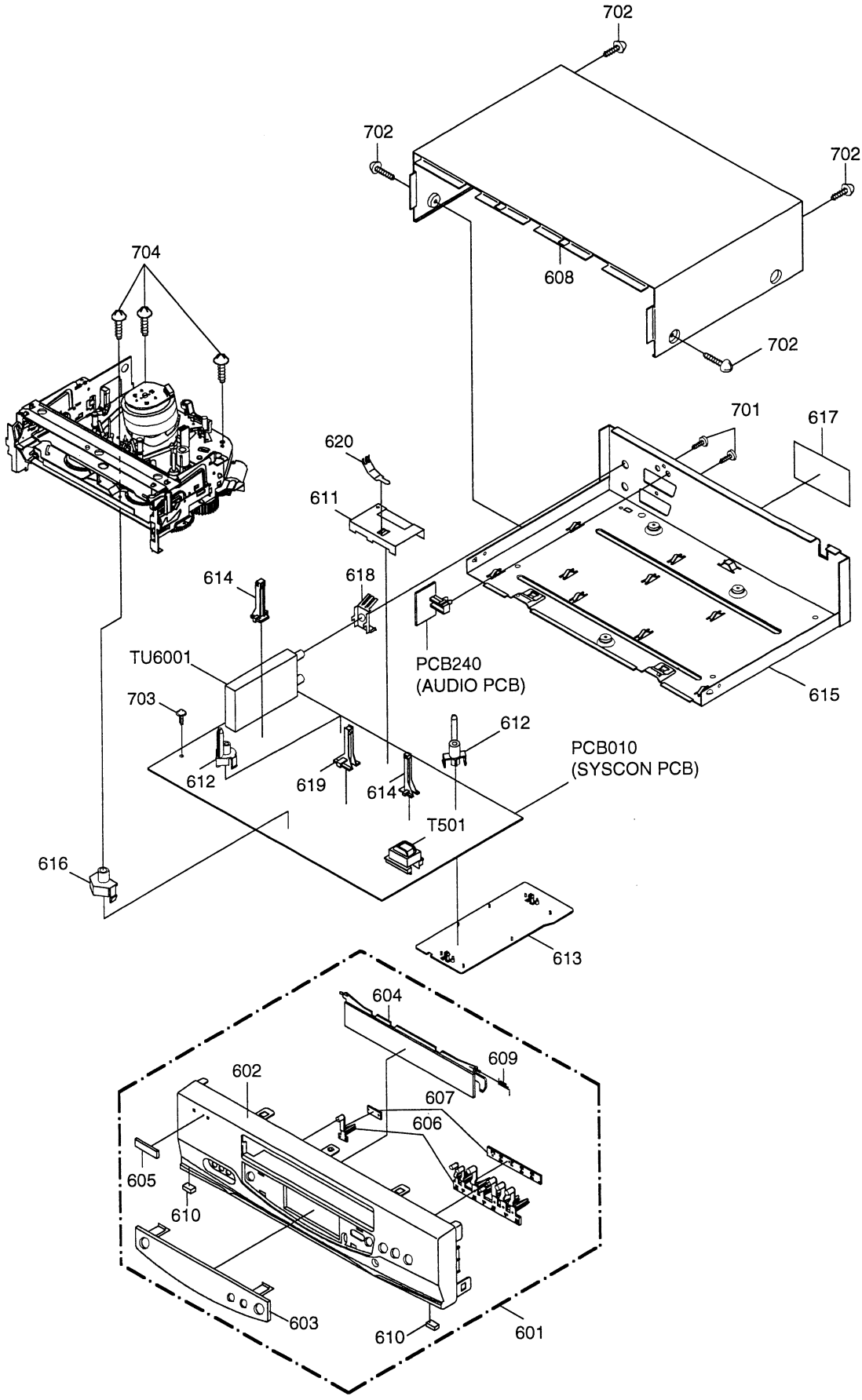
⑤ REC, PB
1V 5ms/div



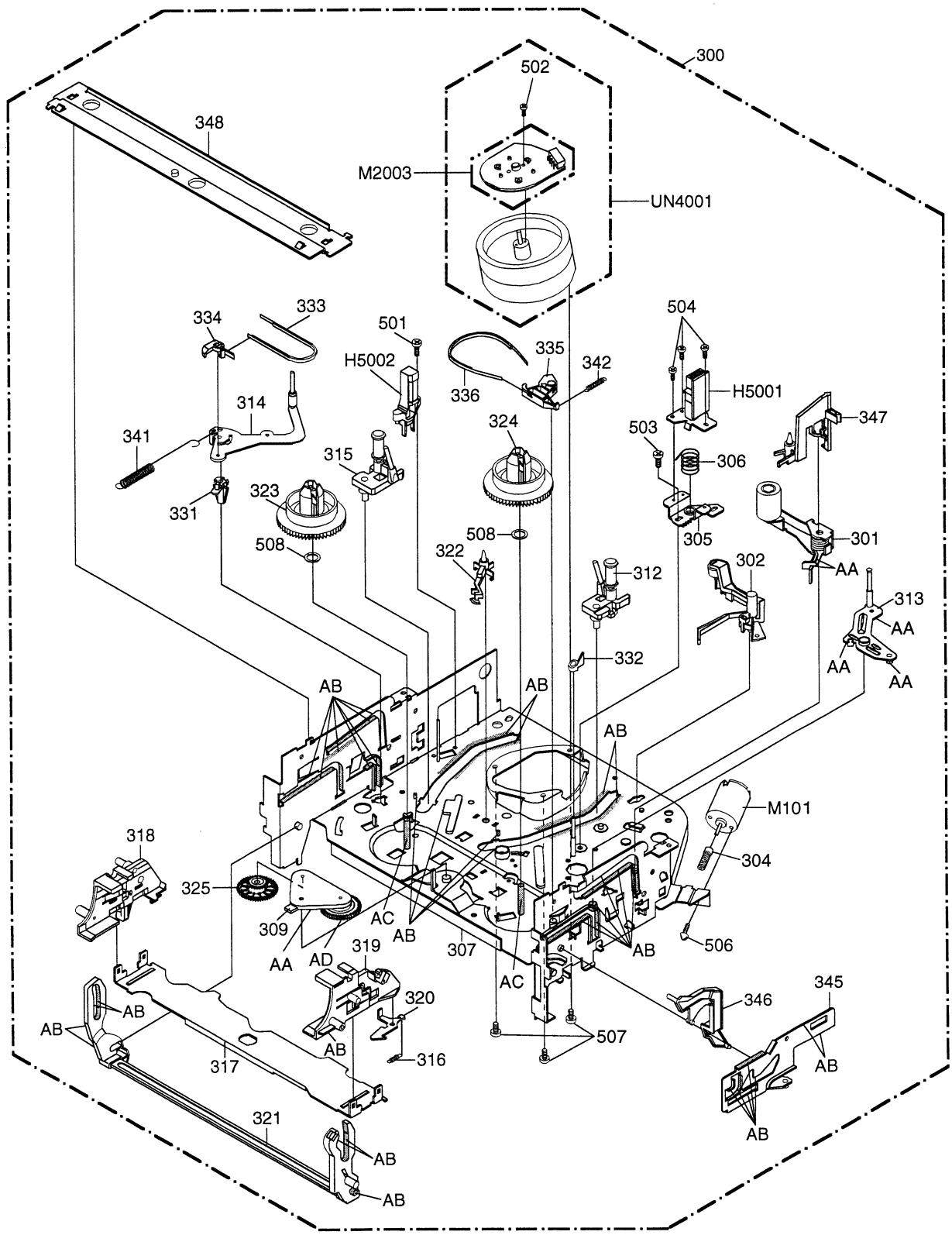
⑱ PB200ms 1.0V/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



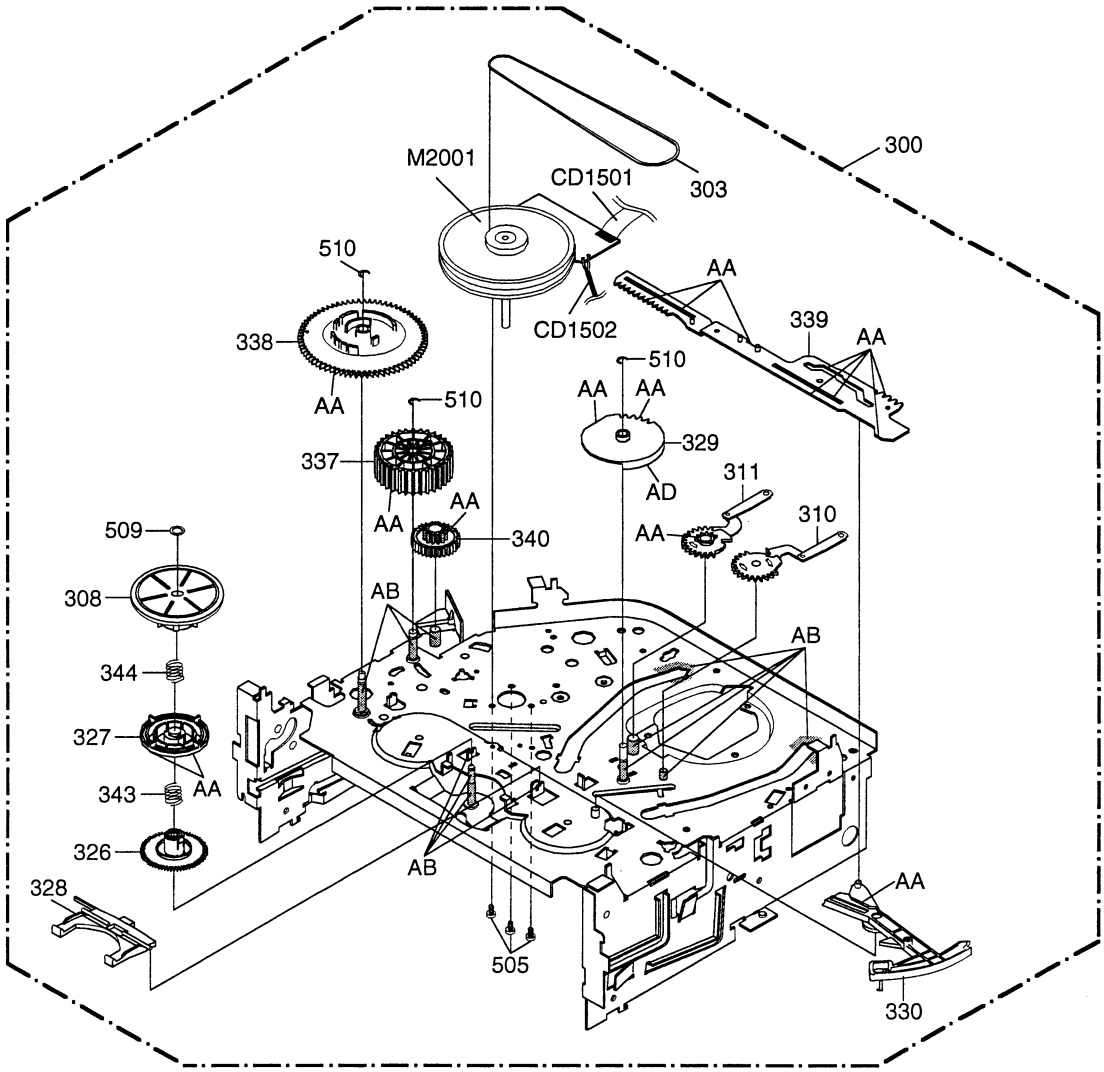
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	MG-33	AB
	FG-84M	AC
	FL-721	AD

NOTE: Applying positions AA, AB, AC and AD for the grease are displayed for this section.
Check if the correct grease is applied for each position.

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	MG-33	AB
	FG-84M	AC
	FL-721	AD

NOTE: Applying positions AA, AB, AC and AD for the grease are displayed for this section.
Check if the correct grease is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		
601	A4F509B720K	CABINET,FRONT ASS'Y		
602	701WPJB440	CABINET,FRONT		
603	711WPDA410	PLATE,DISPLAY		
604	712WPJB185	FLAP		
605	711WPC0005	BADGE,BRAND		
606	735WPAA362	BUTTON,HOLDER		
607	735WPBA297	BUTTON,FRAME		
608	702WSB0060	CABINET,TOP		
609	743WKA0032	SPRING,FLAP(COMBO)		
610	800WFA0045	CUSHION,LEG		
611	752WSA0230	SHIELD,CASE HEAD AMP		
612	701WPA0717	HOLDER,DECK		
613	755WPA0024	PLATE,COVER POWER		
614	85OP700036	HOLDER EOT SENSOR		
615	702WSA0091	PLATE,BOTTOM		
616	701WPA0686	HOLDER,DECK		
617	722202A540	SHEET,RATING		
618	753WUA0057	SPRING,EARTH TUNER		
619	85OP700037	HOLDER,LED		
620	753WUAA006	SPRING,EARTH HEAD AMP		
701	8110230804	SCREW,TAP TITE(P)	BIND	3x8
702	8109230801	SCREW,TAP TITE(B)		3x8
703	8109230704	SCREW,TAP TITE(B)R	BIND	3x7
704	8109130B94	SCREW,TAP TITE(B)R	PAN	3x29
---	791UHA0014	GIFT,SHEET		
---	792UCA0004	PULP,PACKAGE		
---	793UCDA855	GIFT BOX		
---	JB5X0300	POLYBAG		
---	J4E00129	INFORMATION SHEET		
---	J4F50901	INSTRUCTION BOOK		
---	J4F50907	QUICK SET-UP SHEET		
---	A4F509B975	INSTRUCTION BOOK KIT		

CHASSIS REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION	
300	A4F509B420A	DECK ASSY	A4F509B420A	501	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
				502	8107226504	SCREW,TAP TITE(S) BIND	2.6x5
301	85OA400234	PINCH ROLLER BLOCK		503	8107226404	SCREW,TAP TITE(S) BIND	2.6x4
302	85OA500026	AHC ASS'Y		504	8102120604	SCREW,PAN	M2x6
303	85OP200290	BELT,CAPSTAN (S)		505	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
304	85OP600581	WORM		506	810A130404	SCREW/WASHER(A)	M3x4
305	85OP500083	BASE,AC HEAD		507	810A126504	SCREW/WASHER(A)	M2.6x5
306	85OP800324	SPRING,AC HEAD		508	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
307	85OA000459	MAIN CHASSIS ASS'Y		509	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
308	85OA200089	CLUTCH ASS'Y					
309	85OA200090	ARM IDLER ASS'Y		510	83ETW30000	E-RING	3
310	85OA300065	LOADING ARM S UNIT		CD1501	122H071603	CORD JUMPER	SMCD-7X151
311	85OA300066	LOADING ARM T UNIT		CD1502	122Y021902	CORD JUMPER	2Y021902
312	85OA400223	INCLINED BASE T UINT 3S		H5001	1523D91034	HEAD (AUDIO CONTROL)	HVMXA1072A
313	85OA400232	P5 ARM ASS'Y 2		H5002	1543D02013	HEAD (FULL ERASE)	HVFHP0032A
314	85OA400233	TENSION ARM ASS'Y (WT)		⚠ M101	1596S98001	MOTOR (LOADING)	MDB2B66
315	85OA400231	INCLINED BASE S UNIT		⚠ M2001	1510S98036	CAPSTAN DD UNIT	F2QVB08
316	85OP800358	SPRING,LOCKER		⚠ M2003	1589S11015	MICRO MOTOR	I2OAL01
317	85OP900736	CASS,HOLDER		⚠ UN4001	A4F501B500	CYLINDER UNIT ASS'Y	A4F501B500
318	85OP900748	CASS,SIDE L					
319	85OP900749	CASS,SIDE R					
320	85OP900739	LOCKER,R					
321	85OA900228	LINK UNIT					
322	85OP000496	POST,CASS GUIDE					
323	85OP200291	REEL,S (S)					
324	85OP200292	REEL,T (S)					
325	85OP200308	GEAR,IDLER					
326	85OP200311	GEAR,CLUTCH					
327	85OP200312	GEAR,COUPLING					
328	85OP200313	LEVER,CLUTCH					
329	85OP300194	GEAR,MAIN LOADING					
330	85OP400490	LEVER,TENSION					
331	85OP400492	HOLDER,TENSION					
332	85OP400520	CAP.P4					
333	85OP400532	BAND,TENSION					
334	85OP400533	CONNECT,TENSION					
335	85OP600573	ARM,BRAKE T					
336	85OP600574	BAND,BRAKE T					
337	85OP600577	CAM,PINCH ROLLER					
338	85OP600578	CAM,MAIN					
339	85OP600579	ROD,MAIN					
340	85OP600582	GEAR,JOINT					
341	85OP800322	SPRING,TENSION					
342	85OP800350	SPRING,BRAKE T					
343	85OP800355	SPRING,COUPLING					
344	85OP800356	SPRING,RING					
345	85OP900743	LEVER,LINK					
346	85OP900744	LEVER,FLAP					
347	85OP900745	CASS,OPENER					
348	85OP900746	BRACKET,TOP 3V					

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
		RESISTORS	
⚠ R503	R3X181221J	R,METAL OXIDE	220 OHM 1W
R504	R3X28A2R2J	R,METAL OXIDE	2.2 OHM 2W
⚠ R505	R3X28A104J	R,METAL OXIDE	100K OHM 2W
R507	R3X1812R2J	R,METAL OXIDE	2.2 OHM 1W
R514	R65584471J	R,FUSE	470 OHM 1/4W
		CAPACITORS	
⚠ C501	P2472B104M	CMP	0.1 UF 275V PHE840
C507	CB3930MH3M	CC	0.0022UF 250V
⚠ C508	E02LFH220M	CE	22 UF 400V
C521	C0J0B0513K	CC	0.001 UF 500V B or
	C13VB0713K	CC	0.001 UF 2KV B
		DIODES	
D501	D17T002440	DIODE SILICON	1SS244T-77
D502	D1VT001330	DIODE,SILICON	1SS133T-77
D503	D2WXN40050	DIODE,SILICON	1N4005-EIC
D504	D2WXN40050	DIODE,SILICON	1N4005-EIC
D505	D2WXN40050	DIODE,SILICON	1N4005-EIC
D506	D2WXN40050	DIODE,SILICON	1N4005-EIC
D507	D2WXN40050	DIODE,SILICON	1N4005-EIC
D508	D1VT001330	DIODE,SILICON	1SS133T-77
D509	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D510	D2WXB290S0	DIODE SILICON	SB290S
D511	D2LTP10KE0	DIODE,RECTIFIER	RGP10KE-G3
D512	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D513	D1VT001330	DIODE,SILICON	1SS133T-77
D514	D2WXSB1400	DIODE SCHOTTKY	SB140-EIC
D515	D1VT001330	DIODE,SILICON	1SS133T-77
D516	D2WXSB1400	DIODE SCHOTTKY	SB140-EIC
D520	D2WXB290S0	DIODE SILICON	SB290S
D521	D97U01601B	DIODE ZENER	MTZJ16B T-77
D526	D2WXSB1400	DIODE SCHOTTKY	SB140-EIC
D527	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D651	D2WXN40050	DIODE SILICON	1N4005-EIC
D1004	D1VT001330	DIODE,SILICON	1SS133T-77
D1005	0010100320	INFRARED LED	LNA2702L010R
D1006	D2WXN40050	DIODE SILICON	1N4005-EIC
D4001	D1VT001330	DIODE,SILICON	1SS133T-77
		ICS	
⚠ IC501	I1KJ9A4310	IC	KIA431 or
	I0UJ014310	IC	MM1431ATT
IC502	0002E00610	PHOTO COUPLER	LTV-817M-VB
IC1001	I56F57070A	IC	OEC7070A
IC1003	I9UF032310	IC	PST3231NR
IC1099	A4F509B015	IC	S-24C08ADPA-01
IC4001	I04F38217F	IC	HA118217F
IC4501	I0UF014430	IC	MM1443XJ
IC4502	I0QF021500	IC	NJM2150AM
IC4801	I53F4775M0	IC	LC74775M
IC5501	I0KF79605H	IC	TDA9605H
IC6601	I0KFA9873H	IC	TDA9873H
		TRANSISTORS	
Q501	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA
Q503	TC3U037510	TRANSISTOR SILICON	2SC3751
Q505	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
Q506	TAAT01273Y	TRANSISTOR SILICON	KTA1273_Y
Q511	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT
Q651	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q652	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q653	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q654	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q655	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q656	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q657	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q658	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q659	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q660	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q661	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q662	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q663	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q664	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q665	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q1001	0002700590	PHOTO COUPLER	RPI-301
Q1002	0000100380	PHOTO TRANSISTOR	PNA2604M010R
Q1003	0002700590	PHOTO COUPLER	RPI-301
Q1005	0000100380	PHOTO TRANSISTOR	PNA2604M010R
Q1006	0002700670	PHOTO COUPLER	RPI-352Q02
Q1007	0002700670	PHOTO COUPLER	RPI-352Q02

REF. NO.	PART NO.	DESCRIPTION	
		TRANSISTORS	
Q1008	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q1009	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q1010	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q4001	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT
Q4002	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT
Q4003	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
Q4004	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT
Q4005	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q4006	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q4007	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q4501	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q4802	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
		COILS & TRANSFORMER	
L501	021W7A220K	COIL	22 UH
L502	021W7A220K	COIL	22 UH
⚠ L503	029T000083	COIL,LINE FILTER	0R3A433F20
L1001	021W7A220K	COIL	22 UH
L4001	0316160028	COIL,BIAS OSC	1616002
L4002	02167F101J	COIL	100 UH
L4003	02167F101J	COIL	100 UH
L4004	02167F101J	COIL	100 UH
L4005	02167F101J	COIL	100 UH
⚠ L4006	0316160018	COIL,BIAS OSC	1616001
L4008	02167F101J	COIL	100 UH
L4009	021LA6120K	COIL	12 UH
L4010	021LA6221K	COIL	220 UH
L4011	02167F101J	COIL	100 UH
L4012	021LA6390K	COIL	39 UH
L4013	02167F101J	COIL	100 UH
L4014	021LA6R22M	COIL	0.22 UH
L4015	021LA6R22M	COIL	0.22 UH
L4016	021LA6R22M	COIL	0.22 UH
L4502	02167F101J	COIL	100 UH
L4511	021LA6100J	COIL	10 UH
L4512	021LA6100J	COIL	10 UH
L4513	021LA6100J	COIL	10 UH
L4801	021LA6220J	COIL	22 UH
L4802	021LA6101J	COIL	100 UH
L4804	021LA6330K	COIL	33 UH
L4805	021LA6220J	COIL	22 UH
L4806	021LA6390K	COIL	39 UH
L5501	02167F101J	COIL	100 UH
L5502	02167F101J	COIL	100 UH
L6001	02167F220J	COIL	22 UH
⚠ T501	0481220174	TRANSFORMER,SWITCHING	8122017
		JACKS	
J4501	063G000072	SOCKET,21PIN	035_0_8183_00
J4505	060J421023	RCA JACK	MSP-281V3-A
J4506	060J401080	RCA JACK	MSP-281V1-B
J4507	060J401079	RCA JACK	MSP-281V4-B
J4508	060J411023	RCA JACK	MSP-382V-08 PBSN
		SWITCHES	
SW651	0504201T31	SWITCH,TACT	SKHVBED010
SW652	0504201T31	SWITCH,TACT	SKHVBED010
SW653	0504201T31	SWITCH,TACT	SKHVBED010
SW654	0504201T31	SWITCH,TACT	SKHVBED010
SW655	0504201T31	SWITCH,TACT	SKHVBED010
SW656	0504201T31	SWITCH,TACT	SKHVBED010
SW657	0504201T31	SWITCH,TACT	SKHVBED010
SW658	0504201T31	SWITCH,TACT	SKHVBED010
SW1001	0508A11001	SWITCH(LEAF)	MXS01350MVP0
		P.C.BOARD ASSEMBLIES	
PCB010	A4F509B010K	PCB ASS'Y	VMA234A
PCB240	A4F509B240K	PCB ASS'Y	VEA968A
		MISCELLANEOUS	
B501	024HT03564	CORE,BEADS	W4BRH3.5X6X1
B502	024HT03564	CORE,BEADS	W4BRH3.5X6X1
BT601	1412004013	BATTERY,MANGAN	R03(AB)2PXGPI
⚠ CD501	1206458802	CORD AC BUSH	06458802
CD1002	122F061501	CORD JUMPER	2F061501
CD4501	WBL6012038	FLAT CABEL	AWG26 4C BLACK 120MM
CD6002	06CDL02002	RF CABLE PAL FTZ	CDL02002
CP1001	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2
CP4001	0697290620	CONNECTOR PCB SIDE	TOC-C09X-A1
CP4002	069J760019	CONNECTOR PCB SIDE	IMSA-9604S-06Z13
CP4003	0697120320	CONNECTOR PCB SIDE	TMC-T02X-E1
CP4501	067U004029	WIRE HOLDER	B2013H02-4P

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
		MISCELLANEOUS	
CP4502	067U004029	WIRE HOLDER	B2013H02-4P
EL002	124120301A	EYE LET	XRY20X30BD
⚠ F501	080NT1R603	FUSE	50T016HCC
FH501	06710T0006	HOLDER,FUSE	EYF-52BC
FH502	06710T0006	HOLDER,FUSE	EYF-52BC
OS651	077Q037001	REMOTE RECEIVER	PIC-37043LO
TM601	076N0ED150	TRANSMITTER	RC-ED150
⚠ TU6001	0162K01026	RF UNIT	TCMB0601PD13D
V651	0040E94001	LED DISPLAY	LTG-Y2K22M-J
X1001	100CT01207	CRYSTAL	HC-49/U-S
X1002	100DA32R01	CRYSTAL	DT-26
X4001	100CT4R407	CRYSTAL	HC-49/U
X6602	100CT4R009	CRYSTAL	HC-49/U

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR

SPEC.NO.	M4F5-09B
O/R NO.	U1Z4516